Jed Micro PTY LTD T460/T461/T462 manual: V3.84Part B

Specific setups for various projector/screen families

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Projector details by family

For **ASK/Proxima**, see also **InFocus, Eiki, Christie** and **Proxima** projectors.
For **Eiki EIP-200/1000/1600/2500/3000/3500/4500,** see **Sharp,** else **Sanyo** for all others.
For **Christie DS30, PLUS-26, PLUS-26, MATRIX-1500**, else see **Sanyo** for all others covered.
For **3M, Acer**, see **Hitachi** or **Optoma.** For **Viewsonic:** see **Hitachi**

ACER

PD727, P1165, P1265, P5270, P5280, P5370, Generic Acer (use for unlisted models)

(for ACER 755C see Hitachi) (Acer PD523 deleted at rev 2.78. Order prior version from archive if needed again.)

T460 Channel	TX code	Input name in manual	Function as identified on screen
1	* 0 IR 015<0Dh>	D-SUB RGB 1	(Pic. of 15-pin connector) D-SUB
2	* 0 IR 016<0Dh>	DSUB2 RGB or Digital RGB on DVI	(Pic. of DVI connector), DVI (some only)
3	* 0 IR 019<0Dh>	Composite Video	(Pic. of RCA) Composite
4	* 0 IR 018<0Dh>	S-video	(Pic. of DIN 4) S-video
5	* 0 IR 020<0Dh>	DVI-D/Component	(Pic. of DVI connector) Component
6	* 0 IR 017<0Dh>	YPbPr for D-sub	(Pic. of 15-pin connector) Component
7	* 0 IR 028<0Dh>	Analog RGB for DVI Port	(Pic. of DVI connector), DVI
8	* 0 IR 050<0Dh>	HDMI via adaptor cable	(Pic. of HDMI connector), DVI

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

Note: There appears to be some confusion as to whether the second analog RGB is available on the DVI socket with the code we allocate to Channel 2. The generic Acer manual says it is, but the projector tested by JED, a P1265, does not allow it.

Some of this family do support wireless and HDMI channels, but we have been unable to get control strings for these. HDMI does work on the P1265 via a HDMI to DVI cable, using the code we allocate to Channel 8.

Note: You must turn ON source lock in the third menu, "Management" so that a channel can still be selected if there is no current input to that channel.

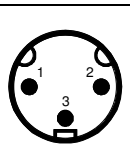
Mute and Freeze functions are provided so all keyboards work fine. These functions are "toggle" mode, so no "two yellow key mute" is available.

The audio level control works OK via the T460 remote to the small internal speaker. There are one or two audio inputs (common audio input for all sources), but only some have an audio output jack to drive external speakers/PA. **It is suggested a T461 be used to provide proper audio control.**

Aspect ratio set-up is supported for 4:3 small, 4:3 reg and 16:9 reg. Aspect ratio is included in the Acer units. Use source names: "Set reg 4:3" and "Set reg 16:9".

RS232 connections to 3-Pin DIN Acer projectors.

Mini-DIN 3 socket on projector. Coms at: 9600 DP8N1 (Note: Rev 2.80 + is needed as previous releases had wrong speed.)

Function/Direction	T460 "projector" Connection	Acer Serial Port Connector	
Ground	Ground	Mini-DIN 3 pin 3 (Gnd)	
Data from T460 to projector	Tx	Mini-DIN 3 pin 2 (RXD)	
Reply data from projector to T460	Rx	Mini-DIN 3 pin 1 (TXD)	

Mini-DIN 3
solder side

After installation wiring of any projector to a T460, use a multimeter to check voltages on BOTH TX and RX pins.

Barco projectors:

BR6300 (and friends)

Barco have a wide range of CRT three-gun projectors and more recently the 6300 model, which is LCD, and a range of DLP units as well. The manual R5975236_08 is the same for all these. They all seem to have identical control RS232 codes, so probably most Barco units will work with the T460 driver by selecting Barco 6300 in the projector setting menu.

Projectors with same codes mentioned in the file R5975236_08 are BD2100, BD3000, BD3100, BD3200, BD3300, BD5000, BD5100, BD8000, BD8100, BG8200, BG9200.

(Some models do not appear to have audio facilities in the projector, although the tested BR6300 does.)

What connections are made to inputs depends on input boards plugged into slots in the front of the projector, and when that slot is functional, a box on the projected image identifies the input card and slot number quite clearly. Unused slots are also indicated when selected. So when setting up, run through the available channels and name them appropriately in the "source" selection setup screen.

Communications runs at 9600 8N1.

T460 Channel	Code, 4th byte	Slot	Screen display
Channel 1	01h	1	Depends on plug-in
Channel 2	02h	2	Depends on plug-in
Channel 3	03h	3	Depends on plug-in
Channel 4	04h	4	Depends on plug-in
Channel 5	05h	5	Depends on plug-in
Channel 6	05h	6	Depends on plug-in
Channel 7	07h	7	Depends on plug-in
Channel 8	08h	8	Depends on plug-in

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs in all the above tables.

RS232 Connection for Barco

We don't have a specific connection diagram for these Barco projectors, but one tested projector has a DB9 Male on the projector. Only TX, RX and Ground were used for the test. (CTS was NOT needed). We assume this is the same for other models. Use a multimeter to determine the TX connection (-9 volts) and connect to the RX in of the T460 (J6 Pin 3). Use multimeter with the projector OFF in "resistance" mode and look for another line with approximately 5k ohm to ground, and assume this is the projector RS232 input and connect to J6 pin 2 of the T460.

BenQ LCD: RP550+, RP551+, RP650+, RP651+, RP700+, RP840G

T460 Channel	Code string	Connector	Screen display
Channel 1	'801s', 22H, '000', 00DH	DB15	VGA
Channel 2	'801s', 22H, '006', 00DH	DVI	DVI
Channel 3	'801s', 22H, '003', 00DH	Video	AV
Channel 4	'801s', 22H, '001', 00DH	HDMI	HDMI 1
Channel 5	'801s', 22H, '002', 00DH	HDMI	HDMI 2
Channel 6	'801s', 22H, '007', 00DH	DisplayPort	DisplayPort
Channel 7	'801s', 22H, '008', 00DH (if FLAGJ=0)	USB-A	MultiMedia
Channel 7	'801s', 22H, '009', 00DH (if FLAGJ=1)	BNC	SPI
Channel 8	'801s', 22H, '010', 00DH	RJ45	NETWORK

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs in all the above tables.

There is no Picture Mute, but Sound Mute is provided.

It is necessary to set the following in the "Tools" menu (4th):

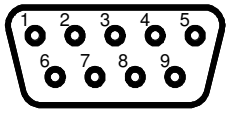
- Control setting -> RS232;
- Monitor ID -> 1;
- Power save -> Off

There is no volume level indication on the LCD image, so the level shown on the T460R is the only available indication.

RS232 connections to BenQ with DB9 male on the LCD

The reply signal from the LCD screen is disabled between transmitted messages, so the usual test with a multimeter can give confusing results, as BOTH the LCD Rx (line into the Rx input) and Tx (reply line from the LCD) measure approximately zero volts and both show a DC resistance of about 5K to ground. The LCD Tx line only outputs a +/- 5 volts waveform when a message is replied to, and then goes back to zero.

These use a 9-pin-D9 male on the LCD, female on the cable. Comms is at 9600 8N1.

Function/Direction	**T460R "Projector" Connection**	**BenQ LCD port Connector**	 D-sub 9 female solder side
Ground	Ground	9-pin D-sub pin 5	
Data from T460 to projector	Tx	9-pin D-sub pin 2 (RXD)	
Reply data from projector to T460	Rx	9-pin D-sub pin 3 (TXD)	
Plus 9 volt CTS/DTR to projector	N/C	N/C	

BenQ projectors:

BenQ SP820 **see: Optoma: EP771/772/774**

BenQ projectors: SH960

(This model does not have <CR> before and after commands)

T460 Channel	**Code string**	**Connector**	**Screen display**
Channel 1	*sour=RGB#	DB15	PC
Channel 2	*sour=RGB2#	RCA	Component 2
Channel 3	*sour=vid#	Video	Video
Channel 4	*sour=svid#	S-Video	S-Video
Channel 5	*sour=ypbr#	DB15	Component 1
Channel 6	*sour=hdmi#	HDMI	HDMI

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs in all the above tables.

- Reply mode not available;
- In System Setup: "Auto Power Off" -> "Disable, "Sleep Time" -> Disable, "Quick Auto Search" -> Off;
- In Advanced Setup: In Lan Control Settings -> Control by RS232;
- In Advanced Setup: In Baud rate -> 19200;
- In Advanced Setup: Direct Power On -> Set OFF, Direct Power Off -> Set OFF;
- Audio functions are limited to one audio input and no output. Use a T441/T461 if audio control is needed;
- Absolute Mute, Blank and Freeze are available.

BenQ projectors: "BenQ Generic 1" has the standard set of current drivers applicable to all current releases from BenQ. Use this as first preference. It uses the second channel allocation in the table below, but has HDMI2 as channel 7 and network as channel 8.

BenQ projectors: MP512, MP513, MP515, MP515ST. MP522(c, st), MP525, MP525P, MP525ST, MP575, MP576, MP623/MP624, MP626, MP670, MP724/MP727/MP735, MP772st, MP776, MP776st, MP777, MS614, MW811ST, MW714ST, MX615, MX660P, MX670, MX671, MX712UST / MX880UST, MX710, MX711, MX713ST / MX810ST, MX716 / MX717, MX762ST / MX812ST, MX763, MX764, SP840, W600, W1060, W1070, W7000+

T460 Channel	**Code string** (Second codes, MP724/727/735 only)	**Connector**	**Screen display**
Channel 1	<CR>*sour=RGB#<CR>	DB15	Analog RGB (1) /YPbPr (1)
Channel 2	<CR>*sour=dviA#<CR> or <CR>*sour=RGB2#,<CR>	DVI	DVI-A OR RGB2
Channel 3	<CR>*sour=vid#<CR>	Video	Video
Channel 4	<CR>*sour=svid#<CR>	S-Video	S-Video
Channel 5	<CR>*sour= ypbr #,<CR> or <CR>*sour=RGB#<CR>	DB15	Analog RGB/YPbPr (some)
Channel 6	<CR>*sour=hdmi#,<CR>	HDMI	HDMI (some only)
Channel 7	<CR>*sour=dvid#,<CR> or <CR>*sour= hdmi 2#<CR> (SP840, W600)	DVI	DVI-D (some only) or HDMI 2
Channel 8	<CR>*sour=RGB2#,<CR> or <CR>*sour=dviA#<CR>	DB15	Analog RGB (2) /YPbPr (2) (some only) or DVIA

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs in all the above tables.

Note: Reply mode is available for this group. Use of "Reply mode" allows read-back of audio volume, and this is presented on the LCD screen as if it was an absolute volume setting (even though the projector only has "incremental" volume in 10 steps.)

Note: Aspect ratio setting is supported with dummy channels: "Set reg 4:3" and "Set reg 16:9" (some only, not on HDMI).

Note: You must set baud rate to 19200 in the appropriate setup screen and turn off (quick) auto-search.

Note: In "System Setup: Advanced" | Standby Settings | press Enter, then set "Network" to ON to enable RS232 coms**.**

MP724/MP727/MP735 have limited audio, with 2 RCA sockets (L/R) shared by all of: Video/S-Video/DB15-YPbPr, and a 3.5 mm stereo socket shared by: DB-15 PC, DVI-A and DVI-D channels. The HDMI channel has its own audio.
These projectors do control audio, with 10 levels, to the output socket for all inputs. However, and there is no level indication. Use a T461 (4 channel) or T441 (2 channels) for 0->20 audio range and indicated volume on the T460 screen.

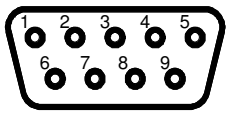
MP626/MP670, MP772st, MP776, MP776st, MP777, MX710/711 have limited audio, with 2 RCA sockets (L/R) shared by all of: Video/S-Video and a 3.5 mm stereo socket shared by: DB-15 PC1, 2, DVI-A and DVI-D channels, (and sometimes DB15(1&2)-YPbPr(1&2)) The HDMI channel has its own audio (sometimes). **These projectors do control audio, with 10 levels, to the output socket for all inputs. However, level out is low, and there is no level indication. (Audio level read-back (0->10) to the T460 screen has been added in "reply" mode, set in the "Set Projector" menu in T460 setup. Use a T461 (4 channel) or T441 (2 channels) controller for 0->20 audio range and indicated volume on the T460 screen.**

2-button-mute mode: Projector Audio mute does not work on some, because of interaction with Picture Blank command (Picture blank is OK, but only in "Reply" mode). **If a T461 is used for audio, audio mutes and picture blanks OK.**

Freeze/mute and mute keyboards are supported, with absolute state shown on the T460 screen **only** in "Reply" mode.

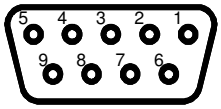
MP512, MP513, MP515, MP515ST, MP522, MP525, MP525P, MP525ST, MP623, MP624: No audio out, only limited audio control or no audio at all, so volume control keys not supported. Freeze and mute keyboards are supported. Use JED T461 for audio. 2-yellow-button picture mute with a T461 is supported. The T461 audio output is also muted appropriately.

RS232 connections to BenQ with DB9 male on projector Comms is at 19200 8N1.

Function/Direction	T460 "projector" Connection	BenQ RS232 port Connector	 D-sub 9 female solder side
Ground	Ground	9-pin D-sub pin 5	
Data from T460 to projector	Tx	9-pin D-sub pin 2 (RXD)	
Reply data from projector to T460	Rx	9-pin D-sub pin 3 (TXD)	
Plus 9 volt CTS/DTR to projector	N/C	N/C	

RS232 connections to BenQ, MP512/MP513/MP522, MP623/MP624

These use a 9-pin-D9 female on the projector, male on the cable. Comms is at 19200 8N1.

Function/Direction	T460 "projector" Connection	Projector Connector (Male on cable)	 D-sub 9 male solder side
Ground	Ground	9-pin D-sub pin 5	
Data from T460 to projector	Tx	9-pin D-sub pin 2 (RXD)	
Reply data from projector to T460	Rx	9-pin D-sub pin 3 (TXD)	
Plus 9 volt CTS/DTR to projector	N/C	N/C	

After installation wiring of any projector to a T460, use a multimeter to check voltages of –9 on BOTH TX and RX pins in any installation, as described in the troubleshooting part of this manual.

BenQ projectors: PB8140/8240/8250/8253/8260/8263
BenQ projectors: PB7100/7200/7220 (and DX850), LG RD-JT50/51/52

T460 Channel	Code, 17th byte	Connector	Screen display
Channel 1	00h	PC1	RGB1
Channel 2	01h	PC2	RGB2
Channel 3	02h	Video YPbPr	Video YPbPr
Channel 4	04h	S-Video	S-Video
Channel 5	05h	Video	Video

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs in all the above tables.

BenQ projectors: PB8140/8240/8250/8253/8260/8263

T460 Channel	Code, 17th byte	Connector	Screen display
Channel 1	00h	D-Sub/Comp. In	Analog RGB
Channel 2	01h	DVI-I	DVI-A
Channel 3	02h	VDI-I	VDI-D
Channel 4	04h	D-Sub/Comp. In	Analog YPbPr
Channel 5	06h	S-Video	S-Video
Channel 6	07h	Video	Composite Video

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs in all the above tables.

BenQ projectors: SP830/831

T460 Channel	Code,	Connector	Screen display
Channel 1	X133X	D-Sub In	Analog RGB
Channel 2	X149X	DVI-I	DVI-A
Channel 3	X131X	Video RCA	Video
Channel 4	X132X	S-Video	S-Video
Channel 5	X135X	Component 3 x RCA	Component
Channel 6	X139X	DVI-I	DVI-D
Channel 7	X140X	RJ-45	RJ-45

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs in all the above tables.
Note: You must turn off "Auto Off" and "Auto Source Search" in the "System Setup" menu.

The SP830/831 projector was fixed at 115,200 baud, and so needed to 460B baud rate converter. Code release 2.76A allows for a new release of software (1.25 or later) in the projector to allow baud rate to be changed via the serial port.

You will need to connect to the projector via a D9 to 8-pin DIN connector cable and run HyperTerminal (or similar comms. program) at115,200 baud. Type the command "X072X" (without the quotes). Then switch HyperTerminal to 19200, turn the projector on manually, and verify that the command "X001X" turns the projector OFF.

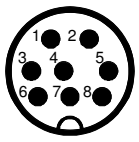
The projector lamp hours function and the Freeze functions do not work in the projector (with the current software), so the Mute/Freeze keyboard is not supported. (This will be rechecked with the 1.25 release ... Ed)

The projector audio system, while it provides an audio input for each source, has control only of the internal speakers. There is an audio output connector, but this is locked to ONLY the audio connectors associated with the D-SUB, at a fixed level. If audio facilities are needed in an installation the T461 audio system MUST be used.

Aspect ratio setting is supported with dummy channels: "Set small4:3", "Set reg 4:3" and "Set reg 16:9".

BenQ, LG projectors: RS232 Connection

(Communications runs at 19200 8N1. Projectors use a male 8-pin mini-DIN on the cable

Function	T460 "projector" Connection	BenQ, LG RD-JT50/52, SP830/831, MP722, MP723, MP771, SP870	DIN 8-pin LG RD-JT51	
Ground	Pin 1	Pin 4	Pin 4	
Serial TX out to projector	Pin 2	Pin 1	Pin 7	Mini-DIN 8 solder side
Serial RX into T460 from proj.	Pin 3	Pin 7	Pin 3	
CTS out to projector	Pin 4	Not used	Not used	

Note: Even though the BenQ manual shows a D sub 9 connector, in fact the tested projector has a mini-DIN 8-pin socket.

Note: The BenQ PB8140/8240/8250 models seem to load the RS232 cable with some sort of diode clamping to ground and to +5 volt. This means that when plugged into the projector the RS232 lines will have a voltage range of only –0.8 to +5.2 volts measurable on them, rather than the normal +/- 9 volts.

However, the projector seems to run OK with this limited voltage range, and the signal from the T460 is safely current limited, so can cope with this weird behaviour! The output from the projector is also this voltage range, which the T460 handles OK. When not plugged in, the T460 output will have normal +/- 9 volt signals.

Canon Generic 1:

Includes: WUX4000/WUX5000, SX6000/WX6000, SX80 Mk II, SX800, WUX10 Mk II

T460 Channel	Message	Projector support	Connector / function	Screen display
Channel 1	'INPUT=A-RGB1',00DH	SX/WX6000 SX800	DB15	Analog PC-1
Channel 1	'INPUT=A-RGB1',00DH	SX80 Mk II WUX10 Mk II	DVI-I	Analog PC-1
Channel 2	'INPUT=A-RGB2',00DH	SX/WX6000	DVI-I	Analog PC-2
Channel 2	'INPUT=A-RGB2',00DH	SX80 Mk II SX800 WUX10 Mk II	DB15	Analog PC-2
Channel 3	'INPUT=VIDEO',00DH	SX80 Mk II SX800	RCA	Video
Channel 4	'INPUT=S-VIDEO',00DH	SX80 Mk II	DIN-4	S-Video
Channel 5	'INPUT=COMP',00DH	WUX4000/5000 SX/WX6000 SX80 Mk II SX800 WUX10 Mk II	DB15	Component
Channel 6	'INPUT=A-RGB',00DH	WUX4000/5000	DB15	Analog PC
Channel 7	'INPUT=D-RGB',00DH	WUX4000/5000	DVI-D	DVI-D
Channel 7	'INPUT=D-RGB',00DH	SX/WX6000 SX80 Mk II WUX10 Mk II	DVI-I	Digital-PC
Channel 8	'INPUT=HDMI',00DH	WUX4000/5000 SX/WX6000 SX80 Mk II WUX10 Mk II	HDMI	HDMI

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs in the above table.

- Set "Direct Power On" to "Off".
- Set "Power management mode" to "Off"
- Supports Mute On/Mute Off keyboard but NOT Freeze On/Off. Supports "reply" mode.
- These typically have one audio, one audio output, but no commands for RS232 control of it.
- Supports aspect ratios: use source names: **"Set reg 4:3"** and **"Set reg 16:9"**

RS232 connections are shown in the user manuals.

Casio XJ-M, XJ-H (and possibly XJ-A) series projectors (LED/Laser)

Includes XJ-M140/XJ-M145, XJ-M240/XJ-M245, XJ-M150/XJ-M155, XJ-M250/XJ-M255
(We note Casio XJ-A have same codes, so assuming timing is similar, would work as well, possibly only needing a variation of warm-up/cool-down times.)

These typically have one PC audio, one Video audio and one HDMI audio input. Audio volume control from the T460 (or the set-top menu) controls audio to the internal 2" speaker. **However, the audio output from the line-output connector is NOT controlled.** For audio level control, use a JED T441 (2-channel) or a T461 (4-channel) audio system. (You must select Audio to "Line" in the "Option Settings 2", then "Audio Out" menus.)

Set "Direct Power On" to "Off".

Supports Mute On/Mute Off keyboard but NOT Freeze On/Off. Supports "reply" mode.

Supports aspect ratios: use source names: **"Set reg 4:3"** and **"Set reg 16:9"**

Casio XJ-M (and possibly XJ-A)

T460 Channel	Message	Connector / function	Screen display
Channel 1	(SRC0)	DB15	RGB
Channel 2	(SRC7)	HDMI	HDMI
Channel 3	(SRC2)	RCA	VIDEO
Channel 4	(SRC9)	DIN-4	S-VIDEO
Channel 5	(SRC1)	DB15	COMPONENT
Channel 6	(SRC6)	DB15	AUTO (RGB/COMPONENT)
Channel 7	(SRC5)	USB	USB

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs in the above table.

Casio XJ-H series: (has 2 RGB ports) XJ-H1600, XJ-H1650

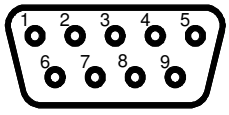
T460 Channel	Message	Connector / function	Screen display
Channel 1	(SRC0)	DB15 1	RGB 1
Channel 2	(SRC3)	DB15 2	RGB 2
Channel 3	(SRC2)	RCA	VIDEO
Channel 4	(SRC9)	DIN-4	S-VIDEO
Channel 5	(SRC1)	DB15 1	COMPONENT 1
Channel 6	(SRC4)	DB15 2	COMPONENT 2
Channel 7	(SRC7)	HDMI	HDMI
Channel 7	(SRC5)	USB	USB

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs in the above table.

RS232 connections to Casio XJ-M, XJ-H series

These use a 9-pin-D9 male on the projector, female on cable. Comms is at 19200 8N1.

Function/Direction	T460 "projector" Connection	Epson ESC-VP21 Control & Service Port Connector
Ground	Ground	9-pin D-sub pin 5
Data from T460 to projector	Tx	9-pin D-sub pin 2 (RXD)
Reply data from projector to T460	Rx	9-pin D-sub pin 3 (TXD)
Plus 9 volt CTS/DTR to projector	N/C	N/C



D-sub 9 female solder side

After installation wiring of any projector to a T460, use a multimeter to check voltages of –9 on BOTH TX and RX pins in any installation, as described in the troubleshooting part of this manual.

Christie projectors:

DS30, PLUS-25, PLUS-26, MATRIX-1500 See ProjectionDesign

Christie Generic E,G:

E series: DHD675-E, DWU675-E, DHD775-E, DWU775-E,
G series: DHD550-G, DWU550-G, DWX600-G, DHD600-G, DWU600-G

This group of large-venue projectors has no audio, so use the two right-hand buttons on the T460 as Mute On / Mute Off, setting flag 3 as necessary for the matching message to your keyboard.

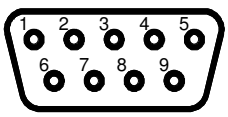
The baud rate must be pre-set to 9600 before use in the "Configuration | Communication | Serial Port Baud rate" menu

T460 Channel	Message	Connector / function
Channel 1	(SIN1) VGA	PC
Channel 2	(SIN5) DVI-D	DVI-D
Channel 3	(SIN9) Composite	Video
Channel 4	(SIN4) HDMI	HDMI on G series
Channel 5	(SIN6) DisplayPort	DisplayPort
Channel 6	(SIN7) Component	Component
Channel 7	(SIN3) HDMI 1	HDMI 1 on E series
Channel 8	(SIN4) HDMI 2	HDMI 2 on E series

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs in the above table.

RS232 connections to Christie projectors

These use a 9-pin-D9 male on the projector, female on cable. Comms is at 9600 8N1.

Function/Direction	T460 "projector" Connection	Epson ESC-VP21 "Control" Port Connector	 D-sub 9 female solder side
Ground	Ground	9-pin D-sub pin 5	
Data from T460 to projector	Tx	9-pin D-sub pin 2 (RXD)	
Reply data from projector to T460	Rx	9-pin D-sub pin 3 (TXD)	
Plus 9 volt CTS/DTR to projector	N/C	N/C	

CommBox LCD panels:

These are now supported via a specially programmed version of a T462, which can send IR-like codes via a 3.5mm connector into the back of the panel. A document describing this is available from JED on request.

DELL projectors:

1200MP, 1201MP, 1800MP, 2400MP, 4100MP, 5100MP

T460 Channel	12th byte	Connector / function	
Channel 1	19h	D-sub 15 VGA 1 Analog	
Channel 2	1Ch	M1 Analog (1800MP only)	
Channel 3	23h	Video Composite on RCA single	
Channel 4	22h	S-Video	
Channel 5	50H	HDMI *(5100MP only)*	
Channel 6	1EH	M1 Component *(4100MP, 5100MP only)*	
Channel 7	20H	3 x RCA Component *(4100MP, 5100MP only)*	1AH : VGA 1 Component *(1200MP, 1201MP only)*
Channel 8	25H	Wireless *(4100MP only)*	

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs in the above table.

Note: These models have only a "Toggle" function for the "Picture Mute" command, and the "Freeze" function does NOT work via RS232 (EVEN THOUGH IT'S IN THE BOOK!). So only use Vol Up/Dn or Mute On/Mute Off keyboards.

DELL: 1209S, 1409X, 1509X, 1609WX, 1610HD, 4210X, 4220, 4310WX, 4320, 4610X, 7609WU, S300/W/WI, S500/W/WI

T460 Channel	12th byte	Connector / function
Channel 1	19h	D-sub 15 VGA 1 Analog
Channel 2	69h	D-sub 15 VGA 2 Analog
Channel 3	23h	Video Composite on RCA single
Channel 4	22h	S-Video
Channel 5	50H	HDMI 1
Channel 6	6BH	HDMI 2 *(7609MP only)*
Channel 7	20H	3 x RCA Component *(7609WU only)*
Channel 8	8BH	Wireless *(4610X only)*

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs in the above table.

Note: These models have absolute picture and sound muting, but no "Freeze" function. Audio is absolute 0 -> 20.

There is NO "Projector Coms OK" message, as there is no ability to access status when OFF. Lamp hours are given after warmup. **Aspect ratio control:** This family supports aspect ratio control via the dummy channel, say, Ch 8, to "4:3/16:9/Zm.".

(DELL 2300MP not supported as there are no absolute power on and separate power off commands

RS232 connections to DELL projectors

To connect the T460 to these projectors use a mini-DIN 6 male on the cable: Communication is at 19200 8N1

Function/Direction	T460 "projector" Connection	Projector Connector 6-pin mini-DIN
Ground	Ground	Mini-DIN Pins 1, 2
Data from T460 to projector	Tx	Mini-DIN Pin 3 (RXD)
Reply data from projector to T460	Rx	Mini-DIN Pin 5 (TXD)
Plus 9 volt CTS/DTR to projector	N/C	N/C

Mini-DIN 6 solder side

After installation wiring of any projector to a T460, use a multimeter to check voltages of –9 on BOTH TX and RX pins in any installation, as described in the troubleshooting part of this manual.

Eiki projectors: Most "LC" group are in "Sanyo" section. "EIP" are in "Sharp" section**.**

Eiki projectors: LC-XIP2000, LC-XIP2600, LC-XIP2610, LC-XNP4000, LC-XDP3500, LC-XSP2600, LC-WIP3000, LC-WSP3000 (called LC-WI/SP3000 in index)

These projectors are odd ones in the Eiki family, and can be controlled for Power, Source select, Mute and Freeze from a T460.

The **XIP2000** has no reply from the projector in "Standby", so there is no initial "Projector Coms OK" message and no lamp hours readout available by pressing both yellow buttons in Standby. Lamps hours are shown at the end of the warm-up time.

The rest do have a valid response in power down, and do show lamp and filter hours when the two yellow buttons are pressed in the standby state. These can be used in reply mode.

Older units: The projector audio system is of no use in an installation with any of these three, as the remote (incremental mode only) commands are unreliable, and 50% of the time actually change source! There is only one (or limited) audio input for all channels. JED suggests the use of a T461 for audio channel selection and absolute level control. ONLY use it with a "Mute On/Mute OFF" or a "Mute On/Off Freeze On/Off keyboard if a T461 is not used. This problem has probably been fixed in the more recent units like the LC-XIP2610, XDP3500 and WIP/WSP3000.

XIP-2000 codes and channel allocations:

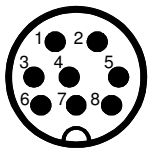
T460 Channel	String sent	Input	Function
1	C02	Computer In 1 (DB15)	Computer Analog 1
2	C04	Computer In 2/YPbPr (DB15)	Computer Analog 2
3	C07	Composite Video (RCA)	Composite Video
4	C06	S-Video (DIN4)	S-Video
5	C03	Computer In 2/YPbPr (DB15)	Computer 2 (YPbPr)
6	C05	DVI or HDMI	HD video
7	C08	Component RCA	YPbPr

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

We note some confusion re channel allocations, with C04 and C03 swapped on some manuals. We are providing all possible codes in the above user selection, but functions may vary from the designation in the third column. Just test!

RS232 connections to Eiki projector LC-XIP2000

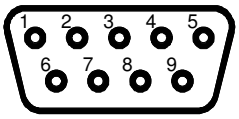
Communications are at 19200 baud. 8N1. Pinout is as shown below. **Note: This manual's pinout (below) follows the DIN standard pinout in these JED drawings, NOT the non-standard one shown in the maker's documentation.**

Function/Direction	T460 "projector" Connection	"Serial" Port Connector	
Ground	Ground	8-pin mini-DIN pins 4, 8	 Mini-DIN 8 solder side
Data from T460 to projector	Tx	8-pin mini-DIN pin 3 (RXD)	
Reply data from projector to T460	Rx	8-pin mini-DIN pin 6 (TXD)	
Plus 9 volt CTS/DTR to projector	N/C	N/C	

After installation wiring of any projector to a T460, use a multimeter to check voltages of –9 on BOTH TX and RX pins in any installation, as described in the troubleshooting part of this manual. **Do this with the projector manually turned ON, as in the "Standby" state, this projector sends out a +6 to +8 volts signal on the reply data line. (Yes! Don't ask!)**

RS232 connections to Eiki projector with DB9 connectors

These use a 9-pin-D9 male on the plasma, female on cable. Comms is at 9600 baud, 8 bits, no parity, 1 stop.

Function/Direction	T460 "projector" Connection	"Serial" Port Connector	
Ground	Ground	9-pin D-sub pin 5	 D-sub 9 female solder side
Data from T460 to panel	Tx	9-pin D-sub pin 3	
Reply data from panel to T460	Rx	9-pin D-sub pin 2	
Plus 9 volt CTS/DTR to panel	N/c	N/c	

Epson ESCVP/21 projectors

Standard channel allocation for first 4 channels for **all** Epson VP21 family groups 1,2, 4, and 5:

T460 Channel	Source code	Connector	Function	Function on screen
Channel 1	SOURCE 11	Input 1, D-Sub 15	Analog RGB 1	Computer 1
Channel 2	SOURCE 21/B1	Input 2/BNC (RGB)	Analog RGB 2	Computer 2 ** some only
Channel 3	SOURCE 41/45	Video RCA	Video	Video
Channel 4	SOURCE 42/60/14* * if FLAG1 set	Video-S/SDI (EB-Z)	S-Video/SDI	S-Video / SDI / Comp DB15/1 (Group 6)

Group 1: Source codes for **Epson Generic 1,** EB-92, EB93/e, EB-95, EB-96W, EB-97, EB-98, EB-440W*, EB-450W/i*, EB-455Wi*, EB-460/i*, EB-465i*, EB-470, EB475W/Wi, EB480/i, EB485W/Wi, EB-520W, EB-525W, EB-530W, EB-535W, EB-536W/i/T, EB-900*, EB-905, EB-910W*, EB-915W, EB-925*, EB-935*, EB-940, EB-945, EB-950W, EB-955W, EB-965, EB-1400Wi, EB1410Wi, EB-1830, EB-1840W, EB-1850W, EB-1860, EB-1870, EB-1880**, EB-1900, EB-1910, EB1915, EB-1920W, EB1925W, EB-1930, EB-1935, EB-1940W, EB-1945W, EB-1950, EB-1954, EB-1955, EB-1960, EB-1964, EB-1965, EB-D6150 EB-D6155W, EB-D6250, EB-S11/H, EB-S12, EB-S17, EB-S21, EB-W17, EB-W22, EB-X11/H, EB-X17, EB-X14H, EB-X15, EB-X20, EB-X21, EB-X22, EB-X25, EMP-600*, EMP/EH-TW100*,
(* need audio setup, ** network option on Ch8)
***(5 x BNC, Ch 8) EB-G5000)

T460 Channel	Source code	Connector	Function	Function on screen
Channel 5	SOURCE 14	Input 1 Component	Component Video	Component
Channel 6	SOURCE 24	Input 2 Component	Component Video	Component
Channel 7	SOURCE 30	HDMI/DVI	Digital In	HDMI/D-RGB/Comp
Channel 8 **	SOURCE 50/53	RJ45	Easy MP network	LAN ** some only
Channel 8 ***	SOURCE B0	5 x BNC	RGB Input	RGB / Component

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs in the above table.

Group 2: Source codes for EB-G5100, EB-G5150, EB-G200W, EB-G5300, EB-G5350, EB-G5600, EB-G5650W, EB-G5900, EB-G5950,

(Channels 1-4 shown above)

T460 Channel	Source code	Connector	Function
Channel 5	SOURCE B1	BNC	RGB
Channel 6	SOURCE B4	BNC	Component Video YCbCr
Channel 7	SOURCE 30	DVI/HDMI	Digital video
Channel 8	SOURCE 24	Input 2 (YPbPr)	Component Video YPbPr

If **FLAG1** is set to a "1", a network command of "SOURCE 50" or "SOURCE 53" is sent for Channel 8.

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs in the above table.

Group 3: Source codes EB-G5450WU, EB-G5500, EB-G5550, EB-G5750WU**, EB-G5800,

Generic EB-Z group includes EB-Z8000W/WU, EB-Z8050WU, EB-Z8150, EB-Z5250, EB-Z8255NL, EB-Z8350W, EB-Z8355W, EB-Z8450WU, EB-Z8455WU, EB-Z9750, EB-Z9800, EB-Z9805W, EB-Z9810, EB-Z9850W, EB-Z9870/U, EB-9875U, EB-Z9900/W, EB-Z10000/UNL, EB-Z10005UNL, EB-Z11000/W, EB-Z11005 No audio (set flag 3).

Ch3: Video (Source 45), Ch4: SDI (Source 60), Ch8: LAN (Source 53) if Flag1 set.

Setting (FLAGJ = 1) AND (FLAGK = 0) Channel 5 sends: "SOURCE 80<0DH>" Selects HDbaseT *

(Channels 1-4 shown above)

T460 Channel	Source code	Connector	Function
Channel 5	SOURCE B4/80 *	INPUT 4, BNC Component	RGB Analog Component/HDbaseT *
Channel 6	SOURCE 30	DVI or HDMI	Digital Video
Channel 7	SOURCE A0	DVI or HDMI	Digital Video
Channel 8	SOURCE 14	INPUT 1, VGA Component/LAN*	Video component (YPbPr)/LAN *

* If **FLAG1** is set to a "1", a network command of "SOURCE 50" or "SOURCE 53" is sent for Channel 8.

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs in the above table.

Group 4: Source codes for TW400, TW520, TW550, TW600, TW700, TW800, TW1000, TW2000, TW2800, TW2900, TW3000, TW3200, TW3500, TW3600, TW3800, TW4000, TW4400, TW4500,TW5000, TW5500, TW5900, TW6000/W, TW8000/W, TW9000/W

(Channels 1-4 shown above) (all no audio)

T460 Channel	Source code	Connector	Function
Channel 5	SOURCE 14	Input 1, D-Sub 15	Component Video
Channel 6	SOURCE 15	INPUT 1/A, D-Sub 15	YPbPr
Channel 7	SOURCE 30	INPUT 3 HDMI /HDMI 1	Digital Video
Channel 8	SOURCE A0	INPUT 5 HDMI 2	Digital Video

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs in the above table.

Group 6: Source codes, EB-4550, EB-4650, EB-4750W, EB-4850WU, EB-4855WU, EB-4950WU, EB-4955WU, EB-G6050W, EB-G6150, EB-G6250W, EB-G6350, EB-G6450WU, EB-G6550WU, EB-G6650WU, EB-G6750WU, EB-G6800, EB-G6900WU. All need audio setup.
Setting (FLAGJ = 1) AND (FLAGK = 0) Channel 5 sends: "SOURCE 80<0DH>" Selects HDbaseT *

(Channels 1-4 shown above)

T460 Channel	Source code	Connector	Function
Channel 5	SOURCE B4 / 80 *	BNC / RJ45 *	BNC Component YPbPr or HDbaseT *
Channel 6	SOURCE 30	HDMI	HDMI
Channel 7	SOURCE 70	DisplayPort	DisplayPort
Channel 8	SOURCE 53	CAT5 / RJ45	Network

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs in the above table.

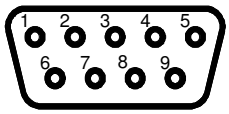
Group 7: Source codes, EB-570, EB-575W/i, EB-580, EB-585W/i, EB-590WT, EB-595Wi, EB-1420Wi, EB-1430Wi, EB-1970W, EB-1975W, EB-1980WU, EB-1985WU, EB-W28

T460 Channel	Source code	Connector	Function
Channel 1	SOURCE 11	DB15 Computer 1	Computer 1
Channel 2	SOURCE 21	DB15 Computer 1	Computer 2 (*some only)
Channel 3	SOURCE 41	RCA	Composite Video
Channel 4	SOURCE 24 / SOURCE 56 / SOURCE 51 / SOURCE 55	DB15 Computer 2 / Screen Mirror / USB Display / Whiteboard	Component Video YPbPr/YCbCr* / Screen Mirror (WiDi) if FLAGJ=1, FLAGK=0 / USB Display if FLAGJ=0, FLAGK=1 / Whiteboard if FLAGJ=1, FLAGK=1
Channel 5	SOURCE 52	USB A	USB
Channel 6	SOURCE 30	HDMI 1	HDMI 1
Channel 7	SOURCE A0	HDMI 2	HDMI 2
Channel 8	SOURCE 53	CAT5	Network

RS232 connections to Epson ESC-VP21 projectors

These use a 9-pin-D9 male on the projector, female on cable. Comms is at 9600 8N1.

Function/Direction	T460 "projector" Connection	Epson ESC-VP21 "Control" Port Connector
Ground	Ground	9-pin D-sub pin 5
Data from T460 to projector	Tx	9-pin D-sub pin 2 (RXD)
Reply data from projector to T460	Rx	9-pin D-sub pin 3 (TXD)
Plus 9 volt CTS/DTR to projector	N/C	N/C



D-sub 9 female solder side

Fujitsu plasmas:

P42/50/63XHA5xxx, P42/50/55/63XTA51U, P42H/VCA5xxx, P50/63XCA5/6xxx, P42/50XHA58xxx,

Hitachi / 3M / Viewsonic projectors (with 12 or 13 byte codes)

Group 1, simple audio control: CP-X980, CP-X985

Hitachi Group 2, per-channel audio control: Generic 1, (use if not listed) CP-A52, CP-A100, CP-AW100N, CP-A200/N, CP-A220, CP-A221N, CP-A222WN, CP-A300, CP-A301N, CP-A302WN, CP-A352WN, CP-AW252WN, CP-AW250N/M, CP-AW251N, CP-AW312WN, CP-AW2503, CP-AW2519NM, CP-AW3003, CP-AX2503, CP-AX3003, CP-AX3503, CP-D10, CP-D27WN, CP-D31N, CP-D32WN, CP-DW10N, CP-DW25WN, CP-D20, CP-EW/EX250N, CP-EW/EX300N, CP-TW2503, CP-X8, CP-WX8, CP-WX3014WN, CP-X9, CP-X615, CP-WX625, CP-WX2015WN, CP-WX2021WN, CP- WX3015WN, CP-SX635, CP-X2010/N/Z, CP-X2011/N, CP-X2012WN, CP-X2015WN, CP-X2020, CP-X2021WN, CP-X2510/EN/Z, CP-X2511/N, CP-X2514WN, CP-WX2515WN, CP-X2515WN CP-X2520, CP-X2521WN, CP-X2530WN, CP-X3010/N/Z, CP-X3011/N, CP-X3014WN, CP-X3015WN, CP-X3020, CP-X3021N, CP-X3030WN, CP-X3511, CP-X4011/N, CP-X4014WN, CP-X4015WN, CP-X4020/E, CP-X/WX4021/N, CP-X5021/N, CP-SX8350, CP-WU8440, CP-WU8450, CP-WX8240, CP-WX8255, CP-X8150, CP-X8160, CP-WU8460, CP-WX8265, CP-X8170

Viewsonic, 3M Hitachi Equivalents: PJL3211, PJL9371

No Audio: CP-X9110, CP-X9111, CP-WX9210, CP-WX9211, CP-WU9410, CP-WU9411

Note: We strongly recommend that Hitachi projectors are run in "reply" mode. Hitachi projectors have no "absolute" volume setting commands, but in "reply" mode will return the actual volume setting for a channel and the T460 will display this on the lower line of the LCD for users. ("Non-reply" mode will just show "Volume +/-" on the lower line.)

The Hitachi projector does NOT show a volume level on the projected image as a bar, etc, so the T460 display is made good use of here.

The following table shows the mapping of T460 channel number, the string sent, and the input associated with that channel in the manual, and how it is identified on the on-screen menu: (Coms is at 19200 8N1) Reply mode supported.

T460 Channel	TX code, byte 12	Input name in manual	Function as identified on screen.
1	00h	RGB IN 1	RGB IN 1
2	04h	RGB IN 2	RGB IN 2, (BNC on some, missed in some)
3	01h	VIDEO (or VIDEO 1)	VIDEO (or VIDEO 1)
4	02h*	S-VIDEO (or VIDEO 2)	S-VIDEO *(FLAGJ = 0) & (FLAGK = 0)
4	11h**	HDBaseT	**(FLAGJ = 1) & (FLAGK = 0)
5	05h	COMPONENT VIDEO	COMPONENT VIDEO (some only)
6	03h	HDMI or DIGITAL	HDMI or DIGITAL (some only), M1-D (some only)
7	0Dh	HDMI 2	HDMI 2 (some only)
8	0Bh	LAN	LAN

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.
Note: you MUST set the communications speed for MP8730 using projector menu to 19200 8N1

RS232 connections to Hitachi and 3M, and InFocus Hitachi-made projectors

These use either a D-sub 15 shrink jack pin connector, female on cable, or a DB9, female on cable:

Function/ Direction	**T460 "projector" Connection**	**Hitachi "Control" Port Connector 15-pin shrink**	**Hitachi "Control" Port Connector, DB9** (some)
Ground	Ground	Pin 6, 7 and 10. **Use all pins**	Pin 5
Data from T460 to projector	Tx	Pin 13	Pin 2
Reply data from projector to T460	Rx	Pin 14	Pin 3
Plus 9 volt CTS/DTR	N/C	N/C	N/C

After installation wiring of any projector to a T460, use a multimeter to check voltages of –9 on BOTH TX and RX pins in any installation, as described in the troubleshooting part of this manual. CTS is NOT needed.

Hitachi LCD screens:

FHD6500/6514/6516 touchscreens covered by "Generic1 LCD"

These can have a built-in PC (adding a /PC after then number), called "OPS". Monitor power is turned on and off with T460 On and Off buttons. Power for the OPS (PC) module is controlled by the dummy channels 5 and 6 which turn it On and Off, and Channel 4 selects the built-in PC video/audio output. If using channels 1/2/3 (external inputs) the OPS module can be turned Off.

The following table shows the mapping of T460 channel number, the string sent, and the input associated with that channel in the manual, and how it is identified on the on-screen menu:

T460 Chan	**TX code**	**Function**
1	BE EF 03 06 00 6E D2 01 00 00 20 01 00	External VGA input
2	BE EF 03 06 00 0E D2 01 00 00 20 03 00	External HDMI 1 input
3	BE EF 03 06 00 0E D2 01 00 00 20 03 01	External HDMI 2 input
4	BE EF 03 06 00 FE D2 01 00 00 20 00 00	Internal OPS (PC) input
5	BE EF 03 06 00 BA D2 01 00 00 60 01 00	OPS Unit power On
6	BE EF 03 06 00 2A D3 01 00 00 60 00 00	OPS Unit power Off

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

(RS232 connections still to be determined. Use a multimeter to determine connections.)

InFocus/ASK series drivers

See this site for RS232 code support: http://www.infocus.com/Products/AllProducts.aspx These are done in "series" as follows:

IN2100 group: IN2102/EP, IN2104/EP, IN2106/EP, IN2112, IN2114, IN2116** (Note IN2116 tests as part of this group even though manual shows it should be in IN2110 group), A1100, A1200/EP, IN25, IN27/W, C212, C214, Also IN3914, IN3916 (Comes preset to 115,200, BUT NOW SUPPORTED BY T460 IF PROJECTOR BAUD RATE IS SET MANUALLY TO 19200 using 36th step of Setup Menu)

IN3100 group: IN3102, IN3104, IN3106, IN3108, IN3182, IN3184, IN3186, IN3188, **Note:** We have been unable to get absolute source mapping for (SRC0) to (SRC5) but SRC2 is shown as Composite in one document we have seen, which does NOT agree with other docs. (Comes preset to 115,200, BUT NOW SUPPORTED BY T460 IF PROJECTOR BAUD RATE SET MANUALLY TO 19200 using 36th step of Setup Menu)

IN5100 group: IN5102, IN5104, IN5106, IN5108, IN5110, C447, C500 (preset to 19200 baud)

X6, X7, X9, X15 group: X6/C, X7/C, X9, X15 (Comes preset to 9600 baud, and T460 is set to this speed.)

The following table shows the mapping of T460 channel number, the string sent, and the input associated with that channel in the manual, and how it is identified on the on-screen menu:

T460 Chan.	TX code	IN2100, group, IN3914/16	IN3100/ IN5100 LP815/20	IN3916	IN32 IN34 IN36	IN35/W IN37	SP8602, SP8682	X6, X7, X9, X15 group
1	(SRC0)	VGA1	Comp. 1	LAN	M1 A.PC	M1 D PC	VGA	VGA1
2	(SRC1)	VGA2	Comp. 2	VGA1	M1 A. Vid	M1 D Vid	HDMI 1	VGA2
3	(SRC2)	Comp	Comp. 3	VGA2	M1 Dig	M1 A. PC	HDMI 2	S-Video
4	(SRC3)	S-Video	Video 1	USB	VGA PC	M1 A Comp	Compon 1	Comp. Vid
5	(SRC4)	LitePort**	Video 2	HDMI	Comp. Vid	VGA PC	Compon 2	DVI
6	(SRC5)		Video 3	Comp. Vid	S-Video	VGA Comp	Compon 3	SCART
7	(SRC6)		Video1-RGB	LitePort		Comp Vid	S-Vid	HDMI
8	(SRC7)					S-Vid	Comp. Vid	

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

Aspect ratio set-up is supported for 4:3 small & regular and 16:9 reg. Use source names: "Set small 4:3" "Set reg 4:3" and "Set reg 16:9".

IN100 group (All are preset to 9600 baud**):** IN112a, IN112aT, IN114a, IN114aT, IN114STa, IN116a, IN118HDa, IN120STa, IN124STa, IN126STa

InFocus/ASK series drivers (All codes preset to 115,200, not supported by T460. Set to 19200 manually.)

IN146

IN2110 group: IN2112, IN2114, IN2116 (tested IN2116 shows codes of IN2100 group above)

IN3110 group: IN3114, IN3116

IN5300 group: IN5302, IN5304

IN5500 group: IN5532/L, IN5533/L, IN5535

LP540, LP640, LP650, LP815, LP820, LP840, LP850, LP860 (older group with unidentified SRC allocations to channels 1-6)

(Some other InFocus seem to be similar to BenQ MP722)

The following table shows the mapping of T460 channel number, the string sent, and the input associated with that channel in the manual, and how it is identified on the on-screen menu:

T460 Chan	TX code	IN100 group various LP	IN146, LP540, LP640,		TX code	IN2110, IN3110, groups IN5300, IN5500 groups
1	(SRC0)	VGA1	VGA1		(SRC1)	VGA1
2	(SRC1)	VGA2	VGA2		(SRC2)	VGA2
3	(SRC2)	Composite	HDMI (not LP)		(SRC3)	RGBHV
4	(SRC3)	S-Video	S-Video		(SRC5)	HDMI 1
5	(SRC4)	HDMI	Composite		(SRC6)	HDMI 2
6	(SRC5)				(SRC7)	Component
7	(SRC6)				(SRC8)	S-Video
8	(SRC7)				(SRC9)	Composite

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

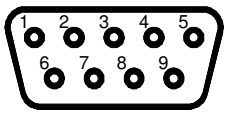
Aspect ratio set-up is supported for 4:3 regular and 16:9 reg. Use source names: "Set reg 4:3" and "Set reg 16:9".

Users can set FlagG (see flag setup menu) to enable sending (Auto Position) after each source transmission to these models.

RS232 connections to InFocus, ASK and Proxima with D9

These use a 9-pin-D9 male on the projector, or on the Cable Wizard cables, female on T460 cable.
Coms is at 19200, except 9600 for X6, X7, X15 series.

Function/Direction	T460 "projector" Connection	"Serial" Port Connector
Ground	Ground	9-pin D-sub pin 5
Data from T460 to projector	Tx	9-pin D-sub pin 2 (RXD)
Reply data from projector to T460	Rx	9-pin D-sub pin 3 (TXD)
Plus 9 volt CTS/DTR to projector	N/c	



D-sub 9 female solder side

After installation wiring of any projector to a T460, use a multimeter to check voltages of –9 on BOTH TX and RX pins in any installation, as described in the troubleshooting part of this manual.

LG LCD, LG Plasma and Zenith Plasma flat screens

LG drivers are divided into groups by:

- Code sent to select an input channel ("kb", "i" or "xb");
- Choices of sources allocated to T460 channels (allowing Analog & Digital TV, Digital TV only, or NO TV at all.)

The channel codes provided in a particular panel are shown in back of the handbook in each case, in the appendix in the section called "Input Select". There are up to 12 channels on some of these units, and as there are only 8 channels in the T460, the group must be chosen appropriately.

LG Group A, B, C for "kb" channel select codes (older panels, but still supported):

This choice is for panels with a "kb" command lead-in (called "Command2:b") is provided by selecting one of Groups A, B or C code sets. The T460 drivers can select a sub-set of up to 8 of these channels to be used. What the particular panel switches to when a particular code is sent is listed in this appendix

Group A for "kb" provides channels "Data = 0, 1, 2, 3, 4, 5, 6, 7" for T460 channels 1 through 8.

Use **Group B** only if an HDMI 1 /DVI channel is needed which needs "Data = 8" to select (Data= 6, RGB-DTV is dropped).

Use **Group C** only if an HDMI 2 channel is needed which needs "Data = 9" to select (Data= 6, RGB-DTV, and Data=7, RGB-PC are both dropped).

LG Group D for "i" channel select codes

Group D codes select: 0=RGB, 1=AV, 2=Component, 3=S-Video. (Zenith P42W26/A and P60W26/A use code "i").

LG Group E, F, G and Group H channel allocations for "xb" codes (newer panels):

Group E: Analog and Digital TV, 2 x A/V, 2 x Component, RGB ("xb 00 50" code) and one HDMI input (older);

Group F: Digital TV, 2 x A/V, 2 x Component, RGB ("xb 00 50" code) and HDMI 1 & 2 input (older);

Group G: Digital TV, 2 x A/V, 2 x Component, RGB ("xb 00 60" code) and HDMI 1 & 2 input (newer);

Group H: NO TV, 2 x A/V, 2 x Component, RGB ("xb 00 60" code) and HDMI 1, 2 & 3 input (newer);

Note: Some PG and LG appear with both 50h and 60h for PC mode in different documents. Thank you LG!

Message	Group E T460 Ch.	Group F T460 Ch.	Group G T460 Ch.	Group H T460 Ch.	Connector / function	Screen display
xb 00 00 <0Dh>	Ch. 1	Ch. 1	Ch. 1		Dig TV tuner	DTV
xb 00 10 <0Dh>	Ch. 2				An. TV tuner	TV
xb 00 20 <0Dh>	Ch. 3	Ch. 2	Ch. 2	Ch. 1	A/V 1 RCA	AV 1
xb 00 21 <0Dh>	Ch. 4	Ch. 3	Ch. 3	Ch. 2	A/V 2 RCA	AV 2
xb 00 40 <0Dh>	Ch. 5	Ch. 4	Ch. 4	Ch. 3	Component 1 (RCA)	Component 1
xb 00 41 <0Dh>	Ch. 6	Ch. 5	Ch. 5	Ch. 4	Component 2 (RCA)	Component 2
xb 00 50 <0Dh>	Ch. 7	Ch. 6			RGB IN (PC) (DB15)	RGB
xb 00 60 <0Dh>			Ch. 6	Ch. 5	RGB IN (PC) (DB15)	RGB
xb 00 90 <0Dh>	Ch. 8	Ch. 7	Ch. 7	Ch. 6	HDMI 1	HDMI 1
xb 00 91 <0Dh>		Ch. 8	Ch. 8	Ch. 7	HDMI 2	HDMI 2
xb 00 92 <0Dh>				Ch. 8	HDMI 3	HDMI 3

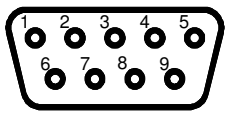
Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs in the above table.

Mute On/Mute Off is supported, but Freeze is not. Pressing both yellow buttons for Mute is supported.

Aspect ratio control is provided via dummy channel names called: "**Set reg 4:3**" and "**Set reg 16:9**".

RS232 connections to LG LCD, LG Plasma and Zenith flat screens

These use a 9-pin-D9 male on the panel, female on cable. Coms is at 9600, 8N1, **Some might use reverse 2/3.**

Function/Direction	T460 "projector" Connection	Fujitsu "Control" Port Connector	
Ground	Ground	9-pin D-sub pin 5	
Data from T460 to projector	Tx	9-pin D-sub pin 2 (RXD)	
Reply data from projector to T460	Rx	9-pin D-sub pin 3 (TXD)	
Plus 9 volt CTS/DTR to projector	N/C	N/C	

D-sub 9 female solder side

After installation wiring of any projector to a T460, use a multimeter to check voltages of –9 on BOTH TX and RX pins in any installation, as described in the troubleshooting part of this manual.

Some have clamp diodes on signal lines so voltages may be limited to -0.7 volts and plus 5v signal pulses.

Mimio (generic) One model quoted is 1865050

Mimio projectors seem to be made by Eiki (they share codes) and have limited information as to wiring, etc.

http://www.mimio.com/en-AP/Support/Mimio-Product-Documentation.aspx

T460 Channel	TX code	Function as identified
1	~vgaa	Computer 1
2	~vgab	Computer 2
3	~composite	Video
4	~svideo	S-Video
5	~hdmi	HDMI

- Two-yellow button Blank & Mute commands are supported;
- Freeze command is available;
- Audio volume control 0 -> 20 is provided.

RS232 connections to Mimio Models: to be advised: a D9 connector is shown in the connection sheet.

After installation wiring of any projector to a T460, use a multimeter to check voltages of –9 on BOTH TX and RX pins in any installation, as described in the troubleshooting part of this manual.

Mitsubishi LCD, (NEC equiv, see NEC: MDT321S, LDT421V, MDT421S, MDT521S, LDT461V) (for LDT651L & P see SHARP LCD Generic PN1 & PN2)
LDT321V, LDT322V, LDT323V, LDT371V, LDT421V, LDT422V, LDT461V, LDT551V, MDT401S, MDT521S, MDT551S follow projector codes with 00_r1->00_r4, 00_v1->00_v4.

Note: Some of these displays have issues re audio control. This is a fault in the LCD panel's firmware.

Mitsubishi projector group 1:

EX10U, ES/EX100U, FL6900, FL7000, HC100/900/1100/1500/1600/3000/3100/3800/3900/4000/4900/5000/6500, HD1000/4000, HD8000, NF32U, NW30U, NW31U, S/X1-U, S/XL2U, S/XL4U, SL6U, XL5U, XL6U, XL8U, S/XL25U, WL639U, XL30U, S/X50U, SA51U, X70-U-, X80U, X100E, S/X120E, S/XD200U, X200E, XD221, SD220U, S/X250U, S290U, UD8400, X/XD300U, X390U, X400-U, XD400/450/460/470/480/490, S/X490U, X500U, XD500, XD510U, XD520, XL9/550/650U, XD1000/2000U, XL1550/2550, WD2000, WD/XD3200, WD8200, WD8350U, WD8400U, WD8700U, WL6700, XD3500U, WD3300, XL5900U, XL5950U, XL5980U/LU. ***EX241U, EX320U/ST, EX321U/ST, EW330U/ST, EW331U/ST have audio 0->10 only, but supported in incremental mode only.

** Below are XD530U, EX53U, FD730U/G ,XD550U, XD560U, WD570U, XD360U-EST, WD380U-EST, XD365U-EST, WD385U-EST, WD390U-EST, XD700U, WD720U, UD740U

T460 Channel	TX code	Input name in manual	Function as identified
1	00_r1 0Dh	Computer 1	Computer 1
2	00_r2 0Dh	Computer 2	Computer 2 (some only)
3	00_v1 0Dh	Video 1 /S-Video	Video 1
4	00_v2 0Dh	BNC/ RCA Video 2/S-Video	Video 2
5	00_d1 0Dh	DVI or HDMI	DVI or HDMI (some only)
6	00_d2 0Dh	DVI	DVI (some only)
7	00_d3 0Dh or 00_n1 0Dh**	SDI or LAN**	SDI (some only) or LAN**
8	00_c1 0Dh or 00_s1 0Dh**	Component or PC-Less **	Component (some) or "PC-less"**

Note: Users can set FlagG (see flag setup menu) to enable sending "00r09<0Dh>" (Auto Position) after each source transmission to these model projectors. (was Flag1)

Split screen mode: A number of Mitsubishi projectors have a split mode, which allows an image to be projected with a **"Computer"** input shown on the left, with sources from: **Computer1, Computer2, DVI, HDMI** or **SDI**, and **"Video"** input on the right from: **Video** or **S-Video**. Split mode is selected by setting up a dummy T460 channel as "Split/Unsplit" and then in operation, stepping to it. It shows this for 2 seconds before returning to a source channel. The projected image then shows side-by-side the most-recently-selected "computer" and "video" sources. Any source selection cancels the "split" mode.

Mitsubishi projector group 2: SD105, S/XD206

Note: This group has slightly different coding, different voltages and different behaviour at startup.

It seems that there is a static protection diode placed across the TX and RX communications lines which means that when the T460 drives the projector, the static voltage seen on the line is clamped at –0.7 volts. When the signal goes positive, instead of going to 9 volts or so positive, it is clamped to about +6 volts. The current limiting characteristics of the RS232 specification are met by the drivers on the T460 so the fact that the T460 is driving current into the clamp diode does not stop correct operation, it just looks funny on a multimeter.

Also, there is no reply from the projector in 'standby' so the normal message indicating 'Projector Coms OK' screen is not available as a system check. Also, no indication of lamp hours is available in 'standby' so instead this is read out at the end of the 'warmup' time and displayed for 2 seconds.

The current volume setting display on the projected image comes on when a 'volume' key is pressed, but does **NOT change** as more pushes are done on the keys. Only the initial setting with one change of level is shown. It is correct if you wait for it to go away after several seconds and then press a Volume once more. Weird! There is only one audio input, so if audio is needed on more channels use a T461 audio box.

There are no absolute aspect ratio commands, rather there is a toggle, so users can change aspect ratio by setting a dummy channel (say, Ch 8) to "4:3/16:9/Zm." and stepping to it to change aspect ratio.

Users can set FlagG (see flag setup menu) to enable sending "00r09<0Dh>" (Auto Position) after each source transmission to these model projectors. (was Flag1)

T460 Channel	TX code	Input name in manual	Function as identified on screen
1	00_r1 0Dh	Computer 1	Computer 1
2	00_r2 0Dh	Computer 2	Computer 2 (some models only)
3	00_v1 0Dh	Video 1 /S-Video	Video 1 (Use varies between models)
4	00_v2 0Dh	BNC/ RCA Video 2/S-Video	Video 2 (Use varies between models)
5-8	Various combination of digital, HDMI, DVID, network, etc provided for higher channels		

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

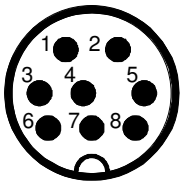
RS232 connections to Mitsubishi projectors (see also D9 following)

These use an 8 or 9-pin mini-DIN male on the cable. Comms is at 9600 baud, 8 bits, no parity, and 1 stop.

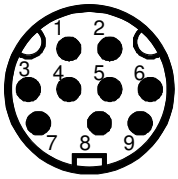
Function/Direction	T460 "projector" Connection	"Serial" Port Connector
Ground	Ground	8 or 9-pin mini-DIN pin 4
Data from T460 to projector	Tx	8 or 9-pin mini-DIN pin 1 (RXD)
Reply data from projector to T460	Rx	8 or 9-pin mini-DIN pin 7 (TXD)
Plus 9 volt CTS/DTR to projector	N/C	N/C

NOTE: Mitsubishi use either an 8 or a 9-pin connector for RS232 (the 9-pin one has some USB lines, which are ignored in use with the T460). Mitsubishi in some cases supply an off-the-shelf mini-DIN 8 to DB9 and a mini-DIN 9 to DB9 cable called by them the "RS232C" cable.

After installation wiring of any projector to a T460, use a multimeter to check voltages of –9 on BOTH TX and RX pins in any installation, as described in the troubleshooting part of this manual.



Mini-DIN 8
solder side

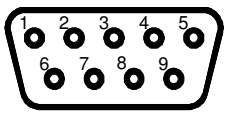


Mini-DIN 9
solder side

RS232 connections to Mitsubishi projectors

These use a 9-pin-D9 male on the proj, female on cable. Comms is at 9600 baud, 8 bits, no parity, and 1 stop.

Function/Direction	T460 "projector" Connection	"Serial" Port Connector
Ground	Ground	9-pin D-sub pin 5
Data from T460 to projector	Tx	9-pin D-sub pin 2 (RXD)
Reply data from projector to T460	Rx	9-pin D-sub pin 3 (TXD)
Plus 9 volt CTS/DTR to projector	N/c	



D-sub 9 female
solder side

After installation wiring of any projector to a T460, use a multimeter to check voltages of –9 on BOTH TX and RX pins in any installation, as described in the troubleshooting part of this manual.

NEC LCD (old codes Mitsubishi projector style codes, e.g. "00_r1<CR>"):
LCD3000, LCD4010, LCD4610, LCD5710, SC40/SC46, Old T1/T2,

NEC LCD (new codes e.g. "SOH,0A0E0A,STX,00600003,ETX,Cksum, <CR>"):
LCD3210, LCD3215, LCD4000, LCD4020, LCD4215, LCD4620, LCD5220, LCD6520, LCD8205, V322, M/P/S/X401, P402, V422, V423, X431BT, M/P/S/X461/S, P/V/X462, V/X463, X464UN/UNV, M/P/S521, V/X551S/UN, P/V/X552, P553, X554UN/UNS, V651, V652, P701, P702, P703, V801, M40/M46 (Multeos)

NEC LCD (E-series):
E324, E424, E464, E554, E654: Called: 'E-Series x1' & 'E-Series x5' for 1/5 volume Inc's / Dec's per press:

NEC Plasma:

42XC10/42XP10, 50XC10/50XP10, 60XC10/60XP10

Also Mitsubishi NEC equiv: MDT321S, LDT421V, MDT421S, MDT521S, LDT461V (for LDT651L & P see SHARP LCD Generic PN1 & PN2

The following table shows the mapping of T460 channel number, the string sent, and the input associated with that channel in the manual, and how it is identified on the on-screen menu:

T460 Chan.	TX code (old)	TX code (new, last 4 digits)	Input name in manual	Function as identified on screen
1	00_r1 <0D>	…0003<STX>	RGB 1 (DVI)	RGB 1 (DVI)
2	00_r2 <0D>	…0001<STX>	RGB 2 (DB15)	RGB 2 (VGA)
3	00_r3 <0D>	…0002<STX>	RGB 3: RGB/BNC	RGB 3
4	00_v1 <0D>	…0005<STX>	VIDEO (1)	VIDEO 1 (Shared S-VIDEO on LCD3000)
5	00_v2 <0D>	…000C<STX>	DVD/HD (RCA)	DVD/HD(1)/Component
6	00_v3 <0D>	…0011<STX>*	S-VIDEO/HDMI	S-VIDEO or HDMI*
7	00_h1 or 00_v4 <0D>	…0004<STX>	HDMI or Video 2	HDMI or VIDEO 2 (Plasma)
8, Flag1=0	Flag1 ignored for old codes	…000F<STX>	DisplayPort	DPORT
8, Flag1=1	(Multeos mode only) 00_t1, 00_t2 or 00_v5 <0D>	…000A<STX>	TV / Component via BNC	t1= TV-A, t2=TV-D, HD(2) (Plasma)

Multeos M40/M46 new mode have different strings (up to 21 bytes) but have same channel allocations as "old" strings. Three different "Set proj" settings are provided for M40/M46 to select Analog or Digital TV for Ch.8 or new mode. Multeos mode is TV-D only on Ch.8.

Switch OFF "ECO standby" mode so RS232 can start "Standby" system.
Use on-screen setup to manually allocate audio inputs to channels. RS232 control of audio only in Multeos mode, **but only to speaker drive, NOT line level drive.**

Switch "INPUT DETECT" to "NONE" to prevent channel changing when non-selected signals come and go.
"DVI MODE" may need to be setup to control type of input signal expected on that input.
"S-VIDEO MODE" should be set to "SEPARATE" so users can select between Composite Video and S-Video sources using the T460. Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

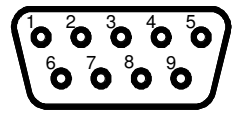
NEC LCD (E-series): E324, E424, E464, E554, E654

T460 Chan.	TX code (last 4 digits)	Input name in manual	Function as identified on screen
1	…0001<STX>	VGA	PC
2	…0011<STX>	HDMI 1	HDMI 1
3	…0012<STX>	HDMI 2	HDMI 2
4	…0013<STX>	HDMI 3	HDMI 3
5	…0005<STX>	Video (Composite)	Video
6	…000C<STX>	Video (Component)	Component
7	…0014<STX>	USB	USB
8	…000A<STX>	DTV	DTV

Note: Volume x5 and x1 options are provided for Audio auto-increment. Choose what works.

RS232 connections to NEC LCD with D9

These use a 9-pin-D9 male on the plasma, female on cable. Comms is at 9600 baud, 8 bits, Odd parity, 1 stop.

Function/Direction	T460 "projector" Connection	"Serial" Port Connector	 D-sub 9 female solder side
Ground	Ground	9-pin D-sub pin 5	
Data from T460 to projector	Tx	9-pin D-sub pin 2 (RXD)	
Reply data from projector to T460	Rx	9-pin D-sub pin 3 (TXD)	
Plus 9 volt CTS/DTR to projector	N/C	N/C	

NEC Plasma: X-42VM5, PX-42VP4/5/5, PX-42XM2/3/4/5, PX-42XR4/5, PX-50XM3/4/6, PX-50XR5/6, PX-60XM5, PX-60XR5, PX-61XM2/3/4, PX-61XR4

The following table shows the mapping of T460 channel number, the string sent, and the input associated with that channel in the manual, and how it is identified on the on-screen menu: (**Note: Freeze and Mute keyboards not supported.)**

T460 Channel	TX code byte 6	Input name in manual	Function on screen
1	01h	BNC	Video 1
2	02h	RCA	Video 2
3	03h	S-VIDEO	Video 3
4	05h	DVD1 / HD1 (3 RCA) Y, Pb(Cb), Pr(Cr)	DH1 / DVD1 / DTV1
5	06h	RGB2 / DVD2 / HD2 (5BNC) ** Y, Pb/Cb, Pr/Cr	DH2 / DVD2 / DTV2
6	07h	9-pin D-sub (Analog)	RGB1 / PC1
7	08h	RGB2 / DVD2 / HD2 (5BNC) ** R, G, B, H/CS, V	RGB2 / PC2 **
8	0Ch	DVI (Digital)	RGB3 / PC3

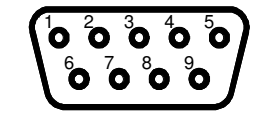
**** Shared inputs, select one function only using BNC-Input setting in "Option 1" menu.**

The audio inputs (on 3 RCA sockets or socket pairs) are allocated to particular video channels in the "Audio" menu using the IR remote control and are stored in non-volatile memory. Set these "links" up at install time.

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

RS232 connections to NEC Plasma with D9

These use a 9-pin-D9 male on the plasma, female on cable. Comms is at 9600 baud, 8 bits, Odd parity, 1 stop.

Function/Direction	T460 "projector" Connection	"Serial" Port Connector	 D-sub 9 female solder side
Ground	Ground	9-pin D-sub pin 5	
Data from T460 to projector	Tx	9-pin D-sub pin 2 (RXD)	
Reply data from projector to T460	Rx	9-pin D-sub pin 3 (TXD)	
Plus 9 volt CTS/DTR to projector	"RTS"	9-pin D-sub pin 8(CTS IN)	

After installation wiring of any projector to a T460, use a multimeter to check voltages of –9 on BOTH TX and RX pins in any installation, as described in the troubleshooting part of this manual.

NEC projectors:

The following table shows the mapping of T460 channel number, the string sent, and the input associated with that channel in the manual, and how it is identified on the on-screen menu:

T460 Channel	TX codes (last 2 bytes)	Input name in manual	Function as identified on screen
1	01h 09h	RGB1 / DVI ANALOG	RGB1 / DVI ANALOG (Some only)
2	02h 0Ah	RGB2 / Component	RGB2 (some only, via D9, DVI or 5 BNC connectors)
3	06h 0Eh	VIDEO (1)	VIDEO (1)
4	0B 13 / 1B 23	S-VIDEO / DisplayPort	S-VIDEO / DisplayPort if FLAGJ = 1
5	10h 18h/22 2A	Component 3 x RCA	Component YPbPr/YCbCr, USB Display FLAGK=1
5 ** alternate	11h 19h	Component 3 x RCA	Component YPbPr/YCbCr HT410/510/LT180 (some)
6	1Ah 22h	DVI Digital / RGB3	DVI Digital / HDMI (some) / Computer 3 (some)
7	03h 0Bh	DVI Analog / RGB3	DVI Analog (some), RGB3/YPbPr (some)
8	20h 28h	LAN	Network on NP1000, NP2000, GT5000, GT6000

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

NOTE: No remote control of audio is available on the VT46/47/460/465/470/560/570/660/670 models. It can be set manually with the buttons on the projector and on the remote control but NOT via an RS232 control. Audio and Video mute work OK, so the volume control keys can be used for mute functions. Use a T461 if audio control is needed.

(Rev 3.12) Aspect ratio setting is supported with dummy channels: "Set small4:3", "Set reg 4:3" and "Set reg 16:9".

NEC groups by options and default baud rates (Groups separated by "/" share codes/manuals)

NEC 38400 baud, no audio: HT1000, HT1100 (fixed 38400), LT25/LT30/LT35, NP40/NP50/NP60, NP41/NP51/NP61/NP62, NP43/NP54/NP63/NP64, NP110/NP115/NP210/NP215.
Different Component code: HT410/HT510, LT180, PH1000U, PX700W, PX750U, PX800X

NEC 38400 baud, with audio (0-62): GT950, GT1150/GT2150, GT5000/GT6000(fixed 38400), LT85/LT150, LT154/LT155/LT156, LT157/LT158, LT280/LT380, NP901W/NP905, NP1000/NP2000, P1150/NP2150/NP3150/NP3151W, NP1250/NP2250/NP3250, NP4000/NP4001, NP4100/NP4100W, PA500U, PA500X, PA500W, PA600X, V230, V230X,V260, V260W,V300X/W
VT440/VT540(fixed 38400), VT770, VT800

NEC 38400 baud, with audio (0-31): WT600, WT610/WT615, LT220/LT240/LT260, LT245/LT265, M230X, M260X/W, M271W/X, M300X/W, M311W/X, NEC M350X, M361X, NP216, U250X, P350W/X, P401W, P420X, P451W/X, P501X, PE401H, PE501X, U260W, U300X, NEC U310W, VE280/X, VE281/X, VE282/X, UM280W/X, UM301W_X, UM330W/X, UM351W, UM361X

NEC 38400 baud, with audio (0-31), new (2014) M, PA series: See below

NEC 19200 baud, no audio: LT75Z, VT37, VT46/VT460/VT465/VT560/VT660, VT47/VT470/VT570/VT575/VT670/VT676, VT48/VT57/VT58,

NEC 19200 baud, with audio (0-62): NP305/NP310/NP405/NP410/W/NP510/W/WS/NP610/S, NP300/NP400/NP500/W/NP600, NP1200, NP2200, NP3200

VT45, VT49/VT59/VT490/VT590, VT480/VT580, VT595/VT695/VT700, VT650,

NEC 9600 (fixed) baud, no audio: LT84/LT140

NEC 38400 baud, with audio (0-31), new (2014) M, PA series: M282X, M302WS, M322W/X, M332XS, M352WS, M362W/X, M402W/X, PA521U, PA522U, PA571W, PA572W, PA621U/X, PA622U/X, PA671W, PA721X, PA672W, PA722X

T460 Channel	TX codes (last 2 bytes)	Input name in manual	Function as identified on screen
1	01h 09h	RGB1 / VGA	RGB1
2	02h 0Ah	RGB2 / VGA / BNC	RGB2 (some only, via D9, or 5 BNC connectors)
3	06h 0Eh	VIDEO	VIDEO (BNC on PA series)
4	0A1H,0A9H	HDMI 1 (new codes)	HDMI 1
5	0A2H,0AAH	HDMI 2 (new codes)	HDMI 2
6	0A6H,0AEH	DisplayPort	DisplayPort
7	022H,02AH	USB-B	(some only)
8	20h 28h	Network or HDBaseT	Network or HDBaseT

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

NOTE 1: LT180/LT25/30/35 all work best with Reply mode enabled in single-projector applications.

NOTE 2: VT48/58 always works in Reply mode, so are NOT suitable for parallel projector operation.

NOTE 3: Freeze keyboard support has been added to release 2.96 for many NEC projectors. If Freeze is supported on the IR remote control then it is usually available via RS232 from a T460.

NOTE 4: If the lower output drive from the projector causes problems driving long cables, on projector where baud rate can be altered, an option exists to set the T460 coms to 4800 baud by setting FLAG1. Change proj. to 4800 also.

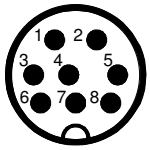
Special setup for NEC for IDLE or ECO mode

As supplied, these projectors appear to default to a deep "Standby" mode when power is off, and they will show no response to the poll as the T460 starts, showing the "Projector not replying" message instead, and refusing to accept an ON command. If you get this message, you will need to go through the setup sequence using the keys on the top of the projector to set the default rest state the "Idle" mode rather than "Standby" mode. This is shown in the user manual (search for the word "idle").

Various other projectors have a similar modes: eg for a NP305/NP310/NP405/NP410/W/NP510/W/WS/NP610/S family device, the key sequence is: Menu > (right arrow twice) Setup > Enter > (Down arrow down to) ECO mode > Enter > Up arrow (turn ECO mode OFF) > Enter > Exit > Exit > Exit

RS232 connections to NEC projectors with 8-pin DIN

Communications are at baud rates indicated above by model. We have attempted to use the default baud rate from the manual.

Function/Direction	T460 "projector" Connection	"Serial" Port Connector	
Ground	Ground	8-pin mini-DIN pin 4	
Data from T460 to projector	Tx	8-pin mini-DIN pin 1 (RXD)	
Reply data from projector to T460	Rx	8-pin mini-DIN pin 7 (TXD)	
Plus 9 volt CTS/DTR to projector	N/C	N/C	

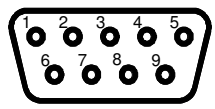
Mini-DIN 8 solder side

Note: On the LT260 (and maybe the 240 and 220) the measured voltages from the projector were considerably lower, measuring a standing –4 volts, and signals going to +4 peak, which is OK for the RS232 spec, but lower than usual. (The T460 puts out + and – 9 volt signals.)

If the lower output drive from the projector causes problems driving long cables, on projector where baud rate can be altered, an option exists to set the T460 coms to 4800 baud by setting FLAG1. Change proj. to 4800 also.

RS232 connections to NEC Projector with D9

These use a 9-pin-D9 male on the plasma, female on cable. Comms is at 19200 or 38400 baud, 8 bits, no parity, 1 stop.

Function/Direction	**T460 "projector" Connection**	**"Serial" Port Connector**	 D-sub 9 female solder side
Ground	Ground	9-pin D-sub pin 5	
Data from T460 to projector	Tx	9-pin D-sub pin 2 (RXD)	
Reply data from projector to T460	Rx	9-pin D-sub pin 3 (TXD)	
Plus 9 volt CTS/DTR to projector	n/c	n/c	

After installation wiring of any projector to a T460, use a multimeter to check voltages of –9 on BOTH TX and RX pins in any installation, as described in the troubleshooting part of this manual. (Voltages may be lower (see above under DIN connector.)

Optoma (Inc. BenQ, Planar, Promethean, Vivitech) Note: many prefixes to numbers

Group 1: (Vol: 0->15), DS309, EW728, EW1610,

Group 2:

There have been a number of problems with Optoma projectors NOT accepting the designated Off commands for power, mute and freeze, but only accepting an alternate Off command. We have no way of knowing if this is a permanent situation, or if the accepted commands will change in future. To help overcome this, this release includes "generic" drivers so users have a choice of choosing between the options. The last number in the generic name is the maximum volume setting.

One group, designated with 1/0 in the name uses strings: ~0000 1 and ~0000 0 (power On/Off, etc).

The other group, with 1/2 in the name uses strings: ~0000 1 and ~0000 2 (power On/Off, etc).

The available names are: **Gen1:1/0 V10, Gen2:1/2 V10, Gen3:1/2 V15, Gen4:1/2 V16 & Gen5:1/2 V20**

(Vol: 0->10), HD25_LV, ZW_ZX_201ST, ZW_ZX_212ST, DS_DX211, W_X305ST, C222, ES_EX_521, DS216, DS219, W290, EH300, S_W_X303, W_X305ST, W_X306ST, **W/X306ST alt (uses alt 0/1),** W_X307USTi, W316, DS317, DX319, DS316, DW318, DS323, DS_DW_DX339, EX400, W_X401, EH500, EH_W_X501, EH_W505, ES_EX520, ES_EX522, ES_TS526, ES_EX530, EX531, EX532, EW_EX_TW_TX536, EX538, EX_TX540, EX_TX542, ES_EX_555, ES_EW_EX_TW_556, X600, EW_EX605ST, X605, EW_EX_TW_TX610ST, EX_TX612, EX_TW_TX615, DX617, DX623, TW_TX631, EW_EX_TW_TX635, EX685UT, EW695UTi, EW_EX_TW_TX762, EW_TW775, EP776, TX778W, EP782_W, EX_TX779, EX784, EX_TX785, EX850, EX855, EW860, EX865, DH1011, DH1015, EH_TH_1060, S_X2010, S_W_X2015, FW_FX5200, TW6000, TX7000, , PRO150S, PRO160S, PRO250X, PRO260X, PRO360W

(*For this group, setting FLAG1 = 1 selects Wireless (~0012 11<0Dh>) for T460 Ch8. Setting FLAGJ=1 and FLAGK=0 sets Channel 6 to DVI-D (~0012 2<0DH>), and setting FLAGJ=1 and FLAGK=1 will set Channel 6 to DVI-I / DVI-A (This is RGB analog on 4 extra pins on the DVI connector by the spade terminal. Both names are used interchangeably.))

(Vol: 0->16), EP752, EP761, EP763, EP/TX1080 (Vol: 0->15), EP/TX783

DS_DX327, DS329, DS_DX_ES_EX_550, DS_DX_ES_EX_TS_TX_551, EX_TX_565UT, EX_TX_665UST, EW_TW_675UT, EW_TW766_W, EX_TX765_W (Vol: 0->20)

Group 3: (Vol:0->10), EW674, EX772, EX_TXR774, TWR1693, HD75, DVI-A is substituted for VGA2) (Vol: 0->15), DX609, EP721, EP723, EP727, EP728, EX525ST, HD71

Group 4: (Audio, vol: 0->10), DS318, EH1020, TH1020, TH1060, GT360, GT700, GT720, HD66,

HD600X, PRO350W, GT750_E, HD33_3300, HD67_6700, HD600X_LV, HD82_8200, HD83_8300, HD86_8600, HD87, PRO8000, EH_TH7500, EH/TH-1060, EH_2060 (no audio), EH7700.

The following table shows the mapping of T460 channel number, the string sent, and the input associated with that channel in the manual, and how it is identified on the on-screen menu. There are three similar groups of codes.

T460 Channel	TX code Group 1	Input name	TX code Group 2* Group 3 **	Input name	TX code Group 4	Input name
1	~0039 5<CR>	VGA1	~0012 5<CR>	VGA1	~0012 5<CR>	VGA1
2	~0039 6<CR>	VGA2	~0012 6<CR> or ** ~0012 2<CR>	VGA2 or ** DVI-A	~0012 1<CR>	HDMI 1
3	~0039 10<CR>	Comp. Vid.	~0012 10<CR>	Comp. Vid.	~0012 10<CR>	Comp. Vid.
4	~0039 9<CR>	S-Video	~0012 9<CR>	S-Video	~0012 9<CR>	S-Video
5	~0039 2<CR>	DVI-D	~0012 8<CR>	VGA 1 Component	~0012 8<CR>	VGA 1 Component
6	~0039 7<CR>	VGA 1 SCART*	~0012 13<CR>	VGA 2 Component	~0012 14<CR>	RCA Component
7			~0012 1<CR>	HDMI	~0012 15<CR>	HDMI 2
8			~0012 2<CR> or * ~0012 11<CR>	DVI-D or * Wireless	~0012 16<CR>	HDMI 3

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

The "Source Lock" option in the "Options" menu MUST be turned ON (to stop the projector searching for other channels when an input is dropped.) Under "Options | Advanced | Power Mode (Standby)" set to "Active".

Aspect ratio control is included. Use source names: "Set reg 4:3" and "Set reg 16:9".

There are audio inputs for all signal inputs, and the RS232 control system controls the audio level to the audio output jack.

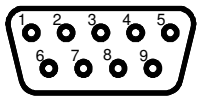
MuteOn/Mute Off and Freeze On/Off and Mute On/Off keyboards are supported, and work normally.

RS232 connections to Optoma Group 1 projectors: Use the three-pin DIN wiring diagram below.

Data in is on pin 2 (RXD) Comms is at 9600 8N1

RS232 connections to Optoma Group 2: EP776, EP782 etc projector with D9

These use a 9-pin-D9 male on the proj, female on cable. Comms is at 9600 baud, 8 bits, no parity, 1 stop. Note: This is opposite to the Optoma D9 wiring below!!

Function/Direction	T460 "projector" Connection	"Serial" Port Connector	
Ground	Ground	9-pin D-sub pin 5	
Data from T460 to projector	Tx	9-pin D-sub pin 3 (RXD)	D-sub 9 female solder side
Reply data from projector to T460	Rx	9-pin D-sub pin 2 (TXD)	

After installation wiring of any projector to a T460, use a multimeter to check voltages of –9 on BOTH TX and RX pins in any installation, as described in the troubleshooting part of this manual.

Optoma: Group 4: EP706, EP708S, EP709, EP712E, EP719H

The following table shows the mapping of T460 channel number, the string sent, and the input associated with that channel in the manual, and how it is identified on the on-screen menu. **No audio** in provided, so use a T461 if audio control needed:

T460 Channel	TX code	Input name in manual	Function as identified on screen
1	ID00IR021	VGA RGB/YPbPr/YCbCr/SCART	VGA (1)
2	ID00IR022	D-SUB 2	VGA2 (EP719 only)
3	ID00IR024	Composite Video	VIDEO
4	ID00IR023	S-Video	S-VIDEO
5	ID00IR020	DVI-D	DVI (EP709, EP712, EP719H only)

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs. The "Source Lock" option in the "Management-I" menu MUST be turned ON (to stop the projector searching for other channels when an input is dropped.)

Note: Aspect ratio control is included. Use source names: "Set small4:3", "Set reg 4:3" and "Set reg 16:9".
Note: MuteOn/Mute Off and Freeze On/Off and Mute On/Off keyboards are supported, and work normally. If a Volume keyboard is used, a T461 is needed.
Note: **Coms is at 9600 8N1.** Optoma EP706, EP708S, EP709, EP712E, EP719H, EW766/W, EX765/W definitely use pin 2 (above) as an input, in the three-pin DIN wiring diagram below.

Optoma Group 5: Promethean, BenQ, Vivitek: EP771/772/774, Planar: PR5020, Promethean PRM-25, PRM-35, EST-P1, BenQ: SP820, Vivitek Generic 1, 2, 3

These are all made by the same manufacturer, Delta, in China and have the same codes. (Boxlight Pro45000dp is similar).

The Vivitek range us a mixture of two-letter source codes (eg ~SR, ~SG) and numeric S codes (eg ~S1, ~S2). Some understand both source select types, but not for all channels (eg D5000, D6000, Boxlight need ~S2 to access the RGBHV BNC channel). All transmissions to Vivitek operate with large inter-character spacing, needed for reliability, and none of them reply with a status in standby so no "projector Coms OK" message is possible. Lamp hours (single and dual) are read out after warmup is completed. No reply mode is possible with these, either.

NOTE: Vivitek D5500 uses quite different (Sanyo-like) codes but at a non-standard speed (for Sanyo) of 38400. It is not supported at this time.

The Promethean PRM-25, PRM-35, EST-P1, have NOT been tested at this release, but follows all this group's codes. (Reports appreciated.)

The following table shows the mapping of T460 channel number, the string sent, and the input associated with that channel in the manual, and how it is identified on the on-screen menu.

Aspect ratio control is provided via dummy channel names called: "Set reg 4:3" and "Set reg 16:9" and "Set small 4:3" for the Optoma and Vivitek Generic 1. Vivitek Generic 1 and Generic 3, and Promethean PRM-25, and Planar and BenQ have only "Set reg 4:3" and "Set reg 16:9" with other codes.

Mute and Freeze are provided, but because they are toggles, "two yellow button mute" mode is not. Reply mode NOT used.

T460 Channel	TX code, all, Viv. Gen 1, 2	TX code Viv. Gen3	Input name in manual		Function as identified on screen
1	~SR<0Dh>	~S1<0Dh>	RGB 1 In via DB15		Analog RGB
2	~SG<0Dh>	~S2<0Dh>*	RGB 2 In via DB15	* RGBHV-BNC	(Not all)
3	~SV<0Dh>	~S5<0Dh>	Video In RCA		Video
4	~SS<0Dh>	~S6<0Dh>	S-Video In		S-Video
5	~SY<0Dh>	~S4<0Dh>	Component Video via DB15/RCA		Component Video
6	~SD<0Dh>	~S7<0Dh>	DVI-D In/HDMI 1		DVI/HDMI 1
7	~SW<0Dh>	~S3<0Dh>	Wireless		(Not all)
8	~SH<0Dh>	~S8<0Dh>	HDMI 2		HDMI (Not all)

NOTE: Optoma: You MUST turn the "Source lock" function to "On" in the "Setup" menu (to stop the projector searching for other channels when an input is dropped or is not connected.)

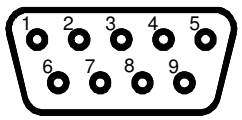
NOTE: BenQ SP820: You must turn off "Auto Source", "Auto Power Off" and "Direct Power On" in Configure Menu.

NOTE: Vivitek: You must turn off "Auto Source", "Auto Power On" and "Auto Power Off" in "Installation II" menu.

RS232 connections to Optoma EP771/772/774 / Promethean PRM-25, PRM-35, EST-P1, BenQ SP820 and Vivitek projectors with D9

These use a 9-pin-D9 male on the proj, female on cable. Comms is at 9600 baud, 8 bits, no parity, 1 stop.

Function/Direction	**T460 "projector" Connection**	**"Serial" Port Connector**
Ground	Ground	9-pin D-sub pin 5
Data from T460 to projector	Tx	9-pin D-sub pin 3 (RXD)
Reply data from projector to T460	Rx	9-pin D-sub pin 2 (TXD)
Plus 9 volt CTS/DTR to projector	n/c	n/c



D-sub 9 female solder side

After installation wiring of any projector to a T460, use a multimeter to check voltages of –9 on BOTH TX and RX pins in any installation, as described in the troubleshooting part of this manual.

Optoma: Group 6: EP780/EP781/EP810/EP910

The following table shows the mapping of T460 channel number, the string sent, and the input associated with that channel in the manual, and how it is identified on the on-screen menu (assuming an ID of "1"):

T460 Channel	**TX code**	**Input name in manual**	**Function as identified on screen**
1	ID01IR021	D-SUB 1	VGA1
2	ID01IR022	D-SUB 2	VGA2
3	ID01IR024	Composite Video	Video
4	ID01IR024	S-Video	S-Video
5	ID01IR020	DVI-D	DVI

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

The "Source Lock" option in the "Management" menu MUST be turned to "Lock" (to stop the projector searching for other channels when an input is dropped.) Note: The **Menu** button sometimes does not work while searching for a signal.

The "RS232 Port" option in the "Management" menu MUST be set to RS232 (Not Network). This is 18 levels down in the menu, and on a second, normally invisible page. **Also set the "Projector ID" in the following menu option to "1".**

Optoma seem confused about the range of the on-board audio volume setting. There is NO indication on the projected screen image of the audio level, but we find that the working range is 0 to 15 as shown on the T460 screen. (The projector shows a range of 0 to 10 in the "Management" menu, from Off to Full. The documentation supplied says it is 000 to 030!)

Aspect ratio is included. Use source names: "Set reg 4:3" and "Set reg 16:9", and seems to work with no issues.

MuteOn/Mute Off and Freeze On/Off and Mute On/Off keyboards are supported, and work normally. Lamp hours are shown at startup. Reply mode is available. Two-yellow-button mute mode is implemented.

Optoma: Group 7: EP1690

The following table shows the mapping of T460 channel number, the string sent, and the input associated with that channel in the manual, and how it is identified on the on-screen menu:

T460 Channel	TX code	Input name in manual	Function as identified on screen
1	ID00IR031	D-SUB 1	VGA1
2	ID00IR032	D-SUB 2	VGA2
3	ID00IR034	Composite Video	PAL (Note: same as for S-Video!)
4	ID00IR033	S-Video	PAL (Note: same as for Video!)
5	ID00IR030	DVI-D	DVI-D

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

The "Source Lock" option in the "Options" menu MUST be turned ON .

This projector puts lots of messages on the screen which are sometimes NOT automatically cleared after a time period.

Channel change messages are cleared as soon as a valid signal is detected, but will stay until this time.

Volume change messages are NOT cleared automatically, and a line, a volume bar graph and a volume number appear and stay just below mid-screen. To clear this message when using the projector for audio switching and level control, set **FLAG4->1** and this will automatically send a "OSD Reset" command 5 seconds after each volume change. **It takes the projector up to 17 seconds to clear the messages, and a couple of screen off and on cycles occur during this time.** If this is not acceptable, we suggest the use of the T461 audio mixer/attenuator.

Aspect ratio is included. Use source names: "Set reg 4:3" and "Set reg 16:9". **However, this also has on screen display issues, in that an aspect ratio message appears mid-screen and stays. (The "OSD Reset" command does NOT help, as sending this command actually changes the screen aspect ratio back to 16/9! Weird! Changing channels also reverts the display mode to 16/9.)** Optoma (in Australia, distributor Amber Technology) are organising a projector software update service which will apparently correct these display message problems. Contact them for an update. When this update is installed, it will not be necessary to set FLAG4.

MuteOn/Mute Off and Freeze On/Off and Mute On/Off keyboards are supported, and work normally.

So as it stands, the Optoma EP1690 works well and appears reliable with a JED controller with a T461 for audio, or with MuteOn/Mute Off and Freeze On/Off and Mute On/Off keyboards.

RS232 connections to 3-Pin DIN Optoma/Acer projectors.

Mini-DIN 3 socket on projector. Coms at: 9600 DP8N1

Function/Direction	T460 "projector" Connection	Optoma/Acer Serial Port Connector	Mini-DIN 3 solder side
Ground	Ground	Mini-DIN 3 pin 3 (Gnd)	
Data from T460 to projector	Tx	Mini-DIN 3 pin 1 or 2 (RXD)	
Reply data from projector to T460	Rx	Mini-DIN 3 pin 2 or 1 (TXD)	

Note: We have seen both options for pins 1 and 2. Check with a multimeter, and the projector output (called "RX" in the above table) will have –5 to –9 volts on it. Acer PD523PD and Optoma EP706, EP708S, EP709, EP712E, EP719H EP780, EP810, EP910 DS309, DX609, EP752, EP761, EP763, EP721, EP723, EP727, EP728, EW766/W and EX765/W definitely use pin 2 (above) as an input.

After installation wiring of any projector to a T460, use a multimeter to check voltages on BOTH TX and RX pins.

Panasonic projectors

Note: Originally all Panasonic projectors communicated at 9600 baud, then over the years a number have introduced 19200 baud default models but always with an "AMX mode" which set coms to 9600. Groups 1a and 4b below are 19200 exclusively, without an AMX mode. These are set, in rev 3.73 to 19200 coms. A new flag setting is available to over-ride the automatic setting, provided because Panasonic has been known to vary code in projectors, in case the baud rate default changes. Setting FlagR = 1 will force all models to 9600 baud, and setting FlagS = 1 sets all to 19200.

The following table shows the mapping of T460 channel number, the string sent, and the input associated with that channel in the manual, and how it is identified on the on-screen menu:

T460 Ch.	TX code					Group 6	Group 7
1	VID					VID	VD1
2	SVD*, Setting FlagJ sets Component, SD1->Ch 7					SVD	VD2*
3	RG1					RG	RG1
	Group 1	**Group 2**	**Group 3**	**Group 4**	**Group 5**		
4	RG2	YUV	HD1	RG2	RG2		RG2
5	YUV	HDM	HD2	YUV	HD1	HD1	HD1
6	DVI	HD1	CP1	HD2	DVI		DVI
7	HDM/HD1	HD2	CP2	HD1	AUX / SD1		CP1
8	NWP	NWP	YUV	NWP	NWP		CP2

Note: Quite a few Panasonic projectors need an address setup. The address mode projectors mainly use a global address of ZZ and a separator of ';".

Group 1a: PT-LB280, PT-LB300, PT-LB330, PT-LB360, PT-LW280, PT-LW330 (all 19200 baud)

PT-VW330E, PT-VW430E, PT-VW431D, PT-VW440E, PT-VX41, PT-VX45, PT-VX400E, PT-VX405, PT-VX500E, PT-VX501, PT-VX510E (9600 with AMX mode) setting flag K=1 sets codes to command DigtalLink system

T460 Channel	TX code	Input name in manual	TX code FlagK=1	Input name Via Dig Link
1	IIS:VID	Composite Video	IIS:DL1:VID	Comp Video
2	IIS:SVD	S-Video	IIS:DL1:SVD	S-Video
3	IIS:RG1	VGA 1	IIS:DL1:HD1	HDMI 1
4	IIS:RG2	VGA 2	IIS:DL1:HD2	HDMI 2
5	IIS:CP1 / IIS:DL1	Component or DigitalLink	IIS:DL1:PC1	PC1
6	IIS:HD1	HDMI 1	IIS:DL1:PC2	PC2
7	IIS:HD2	HDMI 2		
8	IIS:NWP	Network		

Group 2: PT-AE900, PT-AX100, PT-AX200

Group 3: PT-AE4000, PT-AE7000, PT-AE8000EH, PT-AH1000, PT-AR100, PT-AT5000E, PT-AT6000E

Group 4: PT-F-FW100, PT-LB2EA, PT-LB3EA, PT-LB75_NT, PT-LB78, PT-LB90/NT/E, PT-LB80/NT, T-LW80/NT, PT-ST10E, PT-LX22U/E/EA, PT-UX220, PT-LW25HE, PT-LX25HU/E/EA, PT-LX26HU/E/EA, PT-LX30HU/E/EA, PT-UW250, PT-UX/X260, PT-UX/X300, PT-TW230U/E/EA, PT-XW23ST, PT-TW231RU/E/EA, PT-XW25SR, PT-TW240E, PT-TW330E, PT-TW331RE, PT-TX300E, PT-TX301RE, PT-VW530, PT-VW535N, PT-VX60, PT-VX600, PT-VX605N, PT-VZ570, PT-VZ575N

Group 4a: PT-F200E_NTE, PT-F_FW300_NT, (at 9600 with AMX mode)

Group 4b: PT-CW330E, PT-CX300, PT-CW240, PT-CW331RE, PT-CW241RE, PT-CX301RE PT-LX270, PT-LX300, PT-LW321, PT-LW271, PT-LX351, PT-LX321, PT-LX271 (at 19200)

Group 6: PT-LX22, PT-LX26, (Note PT-LX22U/E/H and PT-LX26U/E/H use RG1, not RG)

Group 7: PT-EW530, PT-EW630, PT-EX500, PT-EX600, PT-EZ570. Setting FlagK = 1 swaps VD2 to S-Video

Addressed group 8 without DigitalLink option. Setting flags J and K selects modes. PT-DW100E, PT-DZ680KLS, PT-DW640KLS, PT-DX610KLS, PT-DZ770KLS, PT-DW740KLS, PT-DX810KLS, PT-DZ6710/E/L, PT-DZ6700/E/L, PT-DW6300E/L/S/K, PT-D6000E, PT-D5000E, PT-DZ570E, PT-DW530E, PT-DX500E, PT-DX800/L/S/K, PT-DW730/L/S/K, PT-DZ21K, PT-DS20K, PT-DW17K, PT-DZ8700U, PT-DS8500U, PT-DW8300U, PT-DZ110XE, PT-DS100XE, PT-DW90XE, PT-FX400, PT-FW430, PT-DZ13KE, PT-DS12KE, PT-DW11KE, PT-DZ10KE, PT-DZ16K/D/E/U, PT-EZ770Z, PT-EW730Z, PT-EX800Z, PT-VW340Z, PT-VX410Z, PT-VW345NZ, PT-VX415NZ, PT-VX42Z, PT-DZ870E, PT-DW830E, PT-DX100E, PT-LZ370U

T460 Channel	TX code FlagJ=0, K=0	Input name	TX code FlagJ=1, K=0	Input name
1	IIS:VID	Comp Video	IIS:VID	Comp Video
2	IIS:SVD	S-Video	IIS:YUV	Component
3	IIS:RG1	VGA 1	IIS:RG1	VGA 1
4	IIS:RG2	VGA 2	IIS:RG2	VGA 2
5	IIS:HD1	HDMI 1	IIS:HD1	HDMI 1
6	IIS:DVI	DVI	IIS:HD2	HDMI 2
7	IIS:AUX	Auxiliary	IIS:SDI	Serial Digital Interface
8	IIS:NWP	Network	IIS:NWP	Network

T460 Channel	TX code FlagJ=0, K=1	Input name	TX code FlagJ=1, K=1	Input name
1	IIS:VID	Comp Video	IIS:VID	Comp Video
2	IIS:SVD	S-Video	IIS:SVD	S-Video
3	IIS:RG1	VGA 1	IIS:RG1	VGA 1
4	IIS:RG2	VGA 2	IIS:RG2	VGA 2
5	IIS:HD1	HDMI 1	IIS:HD1	HDMI 1
6	IIS:DVI	DVI	IIS:DVI	DVI
7	IIS:SD1	Serial Digital Interface 1	IIS:SDI	Serial Digital Interface
8	IIS:SD2	Serial Digital Interface 2	IIS:DP1	DisplayPort

Addressed group 8 with DigitalLink option. Setting flags J and K selects modes. PT-EX16K, PT-EX12KU/E, PT-SLX12KC, PT-RZ470, PT-RZ370, PT-RW330. PT-EZ580, PT-EW640/L, PT-EX610, PT-EW540, PT-EX510, PT-RZ475

T460 Channel	TX code FlagJ=0,K=0	Input name	TX code FlagJ=1,K=0	Input name	TX code FlagJ=0,K=1	Input name
1	IIS:VID	Comp Video	IIS:VID**	Comp Video**	IIS:DL1:VID	Comp Video
2	IIS:SVD	S-Video	IIS:DL1	DigitalLink	IIS:DL1:SVD	S-Video
3	IIS:RG1	VGA 1	IIS:RG1	VGA 1	IIS:DL1:HD1	HDMI 1
4	IIS:RG2	VGA 2	IIS:RG2	VGA 2	IIS:DL1:HD2	HDMI 2
5	IIS:HD1	HDMI 1	IIS:HD1	HDMI 1	IIS:DL1:PC1	PC1
6	IIS:DVI	DVI	IIS:DVI	DVI	IIS:DL1:PC2	PC2
7	IIS:DP1	DigitalLink	IIS:PC1	PC1		
8	IIS:NWP	Network	IIS:PC2	PC2		

** setting FlagJ=1,K=1puts SDI here for PT-RZ670, PT-RW630

Addressed Home theatre group: PT-AE4000, PT-AE7000, PT-AE8000EH, PT-AH1000, PT-AR100, PT-AT5000E, PT-AT6000E

T460 Channel	TX code	Input name in manual
1	IIS:VID	Composite Video
2	IIS:SVD	S-Video
3	IIS:RG1	VGA
4	IIS:HD1	HDMI 1
5	IIS:HD2	HDMI 2
6	IIS:CP1	COMPONENT 1 YPBPR
7	IIS:CP2	COMPONENT 2 YPBPR
8	IIS:HD3	HDMI3

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs. Turn off auto-source.

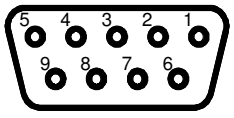
Many don't have audio: use a Freeze/mute or Mute On/Mute Off keyboard only with these, unless a T461 is used.

The PT-AE900/AE1000/AE2000/AE4000/AX100 (and maybe more models) support aspect ratio using the dummy channel "**4:3/16:9/Zm**." ("VS1")

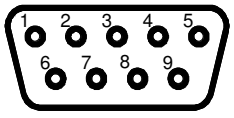
Several Panasonic projectors do not process Mute (Shutter) or Freeze commands.

RS232 connections to Panasonic projectors: Three systems in use:

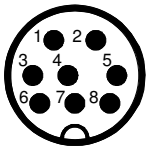
D-SUB 9 Female on projector, male on cable. Comms at 9600 8N1. Select AMX "Discovery" mode to set projector to 9600 if it defaults to 19200.

Function/Direction	T460 "projector" Connection	Panasonic Serial Port Connector	
Ground	Ground	9-pin D-sub pin 5	 D-sub 9 male solder side
Data from T460 to projector	Tx	9-pin D-sub pin 3 (RXD)	
Reply data from projector to T460	Rx	9-pin D-sub pin 2 (TXD)	
Plus 9 volt CTS/DTR to projector	N/C	N/C	

D-SUB 9 Male on projector, female on cable. Comms at 9600 8N1

Function/Direction	T460 "projector" Connection	Panasonic Serial Port Connector	
Ground	Ground	9-pin D-sub pin 5	 D-sub 9 female solder side
Data from T460 to projector	Tx	9-pin D-sub pin 2 (RXD)	
Reply data from projector to T460	Rx	9-pin D-sub pin 3 (TXD)	
Plus 9 volt CTS/DTR to projector	N/C	N/C	

Mini-DIN-8 socket on projector. Comms at 9600 8N1

Function/Direction	T460 "projector" Connection	Panasonic Serial Port Connector	
Ground	Ground	mini-DIN 8 pin 4	 Mini-DIN 8 solder side
Data from T460 to projector	Tx	mini-DIN 8 pin 3 (RXD)	
Reply data from projector to T460	Rx	mini-DIN 8 pin 5 (TXD)	
Plus 9 volt CTS/DTR to projector	N/C	N/C	

After installation wiring of any projector to a T460, use a multimeter to check voltages of –9 on BOTH TX and RX pins in any installation, as described in the troubleshooting part of this manual.

Panasonic LCD

TH-42LF6U, TH-47LF6U, TH-55LF6U, TH-42LF30U, TH-47LF30U, TH-70LF50W, TH-80LF50W, TH-42LF60U, TH-47LF60U, TH-55LF60U, TH-42LFP30, TH-47LFP30, TH-42LF5U, TH-47LF5U, TH-42LFE6E, TH-50LFE6E, TH-47LFT30, TH-47LFX6J

There are many displays covered by these drivers, but to determine the appropriate sources, please examine the pages in the user manual of your display to see which is needed. Do a search (Ctrl "F") for "9600" (the coms baud rate) to get to the page "Serial Terminals connection". This or the next page shows the inputs for this model. Compare these to the table below to see commands needed.

This group of LCD panels are similar to the Plasma displays covered next, but have different channels and different volume range of 0->100 and a 3-digit rather than a 2-digit volume command.

The following tables show the mapping of T460 channel number, the string sent, and the input associated with that channel in the manual, and how it is identified on the on-screen menu:

T460 Channel	TX code	Input name in manual	Function as identified on screen
1	IMS:PC1	PC VGA input (D sub 15)	PC
2	IMS:DV1	DVI -D	DVI-D
3	IMS:AV1	AV1	Video
4	IMS:HM1	HDMI 1	HDMI 1
5	IMS:HM2	HDMI 2	HDMI 2
6	IMS:AV2	AV2	Video / Component on BNC
7	IMS:SL1	Slot 1	Plugin (some only)
8	IMS:S1A	Slot 1A	Plugin (B is not supported) (some only)

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

Connections: Please consult the connection diagram in the user manual for the RS-232 connection. It is usually a D9-male on the cable.

Panasonic plasma

A large number of units are drivable with a T460, and the range of units (assuming they have a serial D9 connector) can all be driven. There are four groups of codes, but to make it simpler, the T460 projector/plasma/LCD selection menu divides the 62 device into eleven "groups". They range from "TH-nnPxGrp3" to "TH-nnPxGrp12" and "TH-nnPxGrp20". The secret to these group names are that the "nn" field represents the screen size, which ranges from 37 to 103 (screen size), the Px field is one or more letters starting with a "P". The code "Grp3" to "Grp20" is the Panasonic "generation" or "group" number. This is often followed by none, one or two letter-codes, often county-specific. It is the number in the "Grp" section of the code which determines the codes needed.

The following tables show the mapping of T460 channel number, the string sent, and the input associated with that channel in the manual, and how it is identified on the on-screen menu:

TH-nnPxGrp3, (eg TH-42PW3), TH-nnPxGrp4 (eg TH-37PWD4), TH-nnPxGrp5 (eg TH-37/42PW5), TH-61PHW6

T460 Channel	TX code	Input name in manual	Function as identified on screen
1	IMS:RG1	PC VGA input (D sub 15)	PC
2	IMS:YP1	Component/RGB in	Component / RGB
3	IMS:VID	AV in (Video/S-Video)	Video

TH-nnPxIIS: (This covers Plasma screens with "IIS" leading to source ID, eg TH-42PWD3, TH-42PW4, TH42PWD4, TH-42/50PHD5, TH-37/42PW5, TH42PWD5) Note: We have also seen the TH-61PHW6 in this group!!

T460 Channel	TX code	Input name in manual	Function as identified on screen
1	IIS:RG1	PC VGA input (D sub 15)	PC
2	IIS:YP1	Component/RGB in	Component / RGB
3	IIS:VID	AV in	Video
4	IIS:SVD	S-Video	S-Video
5	IIS:YP	AV in (Video/S-Video)	Component (alternative)

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

TH-nnPxGrp6, (eg TH-37/42PWD6UX, TH-42/50PHD6),
TH-nnPxGrp7, (eg TH-37/42PWD7UX, TH-50PHD7UX),
TH-nnPxGrp8, (eg TH-37/42PWD8GK/S, TH-37/42PHD8GK/S),
TH-nnPxGrp9, (eg TH-37/42/50PH9UK, PH9(HD) series, PR9(HD) series, PS9(SD) PG9(SD) series),
TH-nnPxGrp10, (eg TH-37/42PR10U/ UK),
TH-nnPxGrp11, (eg TH-42PFH11, TH-42PH11UK, THnn-PF11(FHD), PH11(HD),PR11(HD), LR11(HD) series),
TH-nnPxGrp12, (eg TH-42PD12, TH-50/58/65/85/103PF12, TH-42/50PH12, TH-PF12(FHD) series, TH-PH12(HD) series, TH-PD12(HD) series),
TH-nnVX100, (eg TH-50/65VX100)

T460 Channel	TX code	Input name in manual	Function as identified on screen
1	IMS:PC1	PC VGA input (D sub 15)	PC input
2	IMS:SL1	Slot input	Slot input
3	IMS:SL2	Slot 2 input (video)	Input 2
4	IMS:SL3	Slot 3 input (video)	Input 3
5	IMS:SL1A	Slot 1 input A	These slot fields are only used if dual-input modules are inserted into these slots. They are only used with Plasma panels in group: **TH-nnPxGrp10/11/12**
6	IMS:SL1B	Slot 1 input B	
7	IMS:SL2A	Slot 2 input A	
8	IMS:SL2B	Slot 2 input B	

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

TH-nnPxGrp20: (eg TH-42/50PF20U, TH-42/50PH20W)

T460 Channel	TX code	Input name in manual	Function as identified on screen
1	IMS:PC1	PC VGA input (D sub 15)	PC
2	IMS:YP1	Component/RGB input BNC	Component/RGB (depends on setting of "Component/RGB-IB Select" in panel.)
3	IMS:VD1	Composite Video BNC	Video
4	IMS:SL1	Slot input	Slot input
5	IMS:S1A	Slot input A	These slot fields are only used if a dual-input module is inserted into the slot.
6	IMS:S1B	Slot input B	
7	IMS:HM1	HDMI	HDMI
8	IMS:DV1	DVI-D	DVI

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

RS232 connections to Panasonic Plasma with D9:

We have seen male and female on cable, and pins 2 and 3 both being used for the signal into the panel from the controller. (There is always a connection diagram in the User's Manual, so please consult that document.)

Philips BDL series LCD

Some models we know of matching this driver are: **BDL4230E/BDL4230ET/BDL4651VH/BDL4675XU /BDL4681XU/BDL4785SL, BDL5530EL/BDL5585XL/BDL6450AT/BDL6531E/BDL6551V**

The following tables show the mapping of T460 channel number, the string sent, and the input associated with that channel in the manual, and how it is identified on the on-screen menu. It assumes the optional Video card is installed:
Philips have some 5 versions of protocol currently implemented in these LCD panels. They load software from a memory stick as updates and this can change protocols used. The protocol version does NOT follow the software version loaded. (The 10-pin RJ50 connector is not currently supported.

Protocol 1.6 (Non-addressed mode), 8-byte source messages.

T460 Channel	TX message	Function
1	008H,001H,0ACH,005H,000H,001H,000H,0A1H	VGA D-sub15
2	008H,001H,0ACH,009H,001H,001H,000H,0ACH	DVI-D
3	008H,001H,0ACH,001H,000H,001H,000H,0A5H	Video Composite via RCA
4	008H,001H,0ACH,009H,000H,001H,000H,0ADH	HDMI
5	008H,001H,0ACH,007H,001H,001H,000H,0A2H	Display Port
6	008H,001H,0ACH,008H,000H,001H,000H,0ACH	Card OPS
7	008H,001H,0ACH,003H,000H,001H,000H,0A7H	Component
8	008H,001H,0ACH,001H,001H,001H,000H,0A4H	S-Video

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

Protocol 1.86 (Addressed mode), 9-byte source messages.

T460 Channel	TX message	Function
1	009H,001H,001H,0ACH,005H,000H,001H,000H,0A1H	VGA D-sub15
2	009H,001H,001H,0ACH,009H,001H,001H,000H,0ACH	DVI-D
3	009H,001H,001H,0ACH,001H,000H,001H,000H,0A5H	Video Composite via RCA
4	009H,001H,001H,0ACH,009H,000H,001H,000H,0ADH	HDMI 1
5	009H,001H,001H,0ACH,005H,001H,001H,000H,0A0H	HDMI 2
6	009H,001H,001H,0ACH,007H,001H,001H,000H,0A2H	DisplayPort 1
7	009H,001H,001H,0ACH,006H,001H,001H,000H,0A3H	DisplayPort 2
8	009H,001H,001H,0ACH,003H,000H,001H,000H,0A7H	Component

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

Protocol 1.88 (Addressed mode), 9-byte source messages.

T460 Channel	TX message	Function
1	009H,001H,001H,0ACH,005H,000H,001H,000H,0A1H	VGA D-sub15
2	009H,001H,001H,0ACH,00EH,000H,001H,000H,0AAH	DVI-D
3	009H,001H,001H,0ACH,001H,000H,001H,000H,0A5H	Video Composite via RCA
4	009H,001H,001H,0ACH,00DH,000H,001H,000H,0A9H	HDMI 1
5	009H,001H,001H,0ACH,006H,000H,001H,000H,0A2H	HDMI 2
6	009H,001H,001H,0ACH,00AH,000H,001H,000H,0AEH	DisplayPort 1
7	009H,001H,001H,0ACH,007H,000H,001H,000H,0A3H	DisplayPort 2
8	009H,001H,001H,0ACH,003H,000H,001H,000H,0A7H	Component

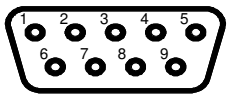
Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

Note: Aspect ratio control, Mute, Blank and Freeze are NOT supported.
Absolute audio volume control is provided and the panel drives external speakers directly. Reply mode is supported.

Protocol 1.6 is a "non-addressed" protocol strings. If you don't know what protocol a particular panel uses, try 1.60 first. If it is a "non-addressed" protocol it will show Comms OK when connected and selected for this. If it shows no coms, try the other two --- it may be an "addressed" protocol that is being used (codes 1.86 and1.86). If it is correctly a "non-addressed" protocol, and several source commands do not work, try the other "non-addressed" one. Similarly, if you have identified the panel as "addressed" (longer messages), and e.g. the HDMI2 command selects VGA, then try the other "addressed" one.

RS232 connections to Philips LCD/LED with D9 OR JACK

Some use a 9-pin-D9 male on the LCD, female on cable. Others use a **4-sleeve miniature audio-type jack (supplied by Philips, cabled to a DB9).** Comms is at 9600 baud, 8 bits, no parity, 1 stop.

Function/Direction	T460 "projector" Connection	"Serial" Port Connector	 D-sub 9 female solder side
Ground	Ground	9-pin D-sub pin 5	
Data from T460 to panel	Tx	9-pin D-sub pin 3	
Reply data from panel to T460	Rx	9-pin D-sub pin 2	

Pioneer plasma

Some models we know of matching this driver are: **PDP-42/50MXE10, PDP-42/50MXE11, PDP-42/50/60MXE20, PDP-43/50MXE1, PDP-425/525CMX, PDP-434/505CMX.**

A large number of models are drivable with a T460, assuming they have a serial D9 connector. There are four entries provided in the T460 projector model/maker data base. All models use the same codes and run at the same speed (9600 baud). Differences are the use of a <STX>GST<ETX> command or a <STX>QST<ETX format for fetching the panel status (used for Plasma running sensing (in reply mode) and the hours meter). The second difference between models is the offset where "hours" data is located in the 56 byte (or 54 byte) reply message.

Pioneer
PDP-PLAS.Gr1 -GST status fetch: 48 offset (Reply mode available) (This is most usual form)

Pioneer
PDP-PLAS.Gr2 -QST status fetch: 48 offset (Reply mode available)

Pioneer
PDP-PLAS.Gr3 -GST status fetch: 46 offset (Reply mode NOT available)

Pioneer
PDP-PLAS.Gr4 -QST status fetch: 46 offset (Reply mode NOT available)

On startup, the T460 resets all existing ID fields and sets up an ID field of "01" for the connected plasma. This ID is then used at the start of each command.

The following tables show the mapping of T460 channel number, the string sent, and the input associated with that channel in the manual, and how it is identified on the on-screen menu. It assumes the optional Video card is installed:

T460 Channel	TX code	Input name in manual and on screen	Function
1	02h,'01IN1',03h	Input 1	VGA D-sub15
2	02h,'01IN2',03h	Input 2	DVI-D
3	02h,'01IN4',03h	Input 4	Video Composite via RCA
4	02h,'01IN3',03h	Input 3	S-Video via DIN4
5	02h,'01IN5',03h	Input 5	Component via RCA

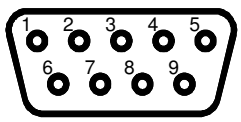
Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

Note: Aspect ratio control is included (not on all). Use source names: "Set reg 4:3" and "Set reg 16:9".
Note: MuteOn/Mute Off and Freeze On/Off and Mute On/Off keyboards are supported, and work normally. Absolute audio volume control is provided and the panel drives external speakers directly.

RS232 connections to Pioneer Plasma with D9

These use a 9-pin-D9 male on the plasma, female on cable. Comms is at 9600 baud, 8 bits, no parity, 1 stop.

Function/Direction	T460 "projector" Connection	"Serial" Port Connector
Ground	Ground	9-pin D-sub pin 5
Data from T460 to panel	Tx	9-pin D-sub pin 3
Reply data from panel to T460	Rx	9-pin D-sub pin 2
Plus 9 volt CTS/DTR to panel	N/c	N/c



D-sub 9 female solder side

After installation wiring of any projector to a T460, use a multimeter to check voltages of –9 on BOTH TX and RX pins in any installation, as described in the troubleshooting part of this manual.

Planar PR5020 projector: see Optoma EP771/772

Plus projectors:

U2-817/1200 (for Taxan/Kaga see Taxan)

The following table shows the mapping of T460 channel number, the string sent, and the input associated with that channel in the manual, and how it is identified on the on-screen menu:

T460 Channel	TX codes bytes 6,7,8	Input name in manual	Function as identified on screen
1	0Dh, 0C4h, 0D4h	RGB	RGB
2	094h, 0C4h, 0DDh	DVI	DVI
3	0DCh, 0C5h, 0D5h	Video	Video
4	0A7h, 0C4h, 0DEh	S-Video	S-Video

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

You will need to disable the "Auto Source" function in the projector so it accepts remote RS232 commands. Not doing so will allow the projector to seek a signal (on, say a Video source) when the PC source drops out), and it ignores serial commands. This is the first item in the "Setup" (third) menu.

Plus projector U4-136 (and probably all others in U4 family)

The following table shows the mapping of T460 channel number, the string sent, and the input associated with that channel in the manual, and how it is identified on the on-screen menu:

T460 Channel	TX codes bytes 6,7,8	Input name in manual	Function as identified on screen
1	0A1h, 0C3h, 0F8h	PC Card	PC Card
2	094h, 0C4h, 0DDh	PC	PC
3	0DCh, 0C5h, 0D5h	Video	Video
4	0A7h, 0C4h, 0DEh	S-Video	S-Video

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

Disable the "Auto Source" function in the projector so it accepts remote RS232 commands.

Plus projector U5-132, U5-232, U5-332, U5-432, U7-132, U7-137

This family of projectors can be operated at 115,200 baud or 19,200 baud. As shipped from Plus, communications is at 115,200 baud, and **must be set using a PC to 19,200 for use with a T460**. (The T460 does NOT have a 115,200 baud option.)

It can be switched to operate at 19,200 by the following sequence:

Connect to a PC via a straight-though serial cable and run HyperTerminal, setting it up to run at 115,200 baud, 8 bit data, 1 start, 1 stop, no parity, no hardware handshake (8N1). (Unless you have enabled "local echo", you will not see the characters as you type them. You can enable echo by going to **File->Properties->Settings->ASCII** Setup and ticking **Echo typed characters locally**.) HyperTerminal is found under Accessories or Programs in the Windows system or can be downloaded from: http://www.hilgraeve.com/htpe/

Verify communications by typing **#QS(CR)(LF)** (The "**QS**" must be upper case. The CR and LF must follow. Send a CR with the **ENTER** key, and send the LF by holding down **CTRL** and pressing **ENTER.**) The projector should reply with its status, eg **#QS2** if OFF, and **#QS6** if warmed up and running.

If, **OFF**, the projector can be turned **ON** with the **#P1(CR)(LF)** command. (The character after the **P** is a numeric **1**.)

Now set it to 19,200 baud by sending a command **#CL(CR)(LF)** from a PC running HyperTerminal at 115,200 baud. (It will switch immediately, so the reply will be gibberish.)

Now terminate the HyperTerminal session at 115,200 baud and restart it at 19200 baud, (8N1, no handshake, local echo enabled). Type **#QS(CR)(LF)** and verify status reply at 19,200 baud. A **#P0(CR)(LF)** command powers down the U5. (The character after the **P** is a numeric **0**.) (The U5 can be reset to 115,200 baud with a **#CH(CR)(LF)** command.)

The baud rate is held in projector non-volatile memory, so the baud rate setting to 19,200 need be done only once. (These commands are in Release N of the manual).

The following table shows the mapping of T460 channel number, the string sent, and the input associated with that channel in the manual, and how it is identified on the on-screen menu:

T460 Channel	TX string	Input name in manual	Function as identified on screen
1	#SR 0Dh, 0Ah	RGB or DVI	RGB (U5) DVI (U7)
2	#SA 0Dh, 0Ah	RGB 2 (also via DVI)	RGB (U7 only)
3	#SV 0Dh, 0Ah	Comp Video	Video
4	#SS 0Dh, 0Ah	S-VIDEO	S-Video
5	#SN 0Dh, 0Ah	NETWORK	NETWORK (we think!?)

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

U5: You MUST enable the "Auto Source" function in the projector ("Setup" menu) so it does not hang up waiting for signals on channels without incoming data when switched by a remote RS232 commands. Also set the "Input Format" to auto for all channels ("Setup" menu). Please inform customers/users that if they select a channel that does NOT have a valid signal, the projector will switch to the next available channel. To set to the desired channel, allow a channel to have data before switching to it. (The need to leave "Auto" enabled is a peculiarity of the U5, and is a better choice than allowing the projector to "hang up" on a channel without a signal.) **(This may have been fixed in firmware upgrades to the U5.)**

U7: Turn OFF the "Auto Source" function in the projector. Function does operate correctly in U7.
Also, turn off "Auto power Off". Instead use the Run Timer in the T460.

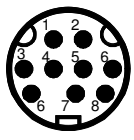
The Plus U5 T460 interface supports Mute On/Mute Off keyboards and Freeze On/Off and Mute On/Off keyboards. The Plus U5/U7 do NOT have an audio output, so while the U5 does have remote control of the projector audio control from the T460, the 5cm loudspeaker is hardly sufficient to be heard in a classroom. We suggest the use of the T461 to control the audio output. **We also suggest you select "Reply mode" when selection of U5 projectors in made, as the Mute and Freeze commands are toggle commands, and the T460 needs to poll the U5 for the current status.**

There is provision for support of the **Aspect Ratio** control commands. A dummy channel **"4:3/16:9/Zm."** allows moving between 4:3 and 16:9 and Zoom screen images. Set up this on, say, channel 6, and move to it with the ON key to change states.

RS232 connections to (all) Plus projectors

U2 and U4 use a short cable with a 9-pin-D9 female one end and a 4-pin USB-style on the other. This cable is supplied by PLUS, and the hole to plug it in is very small, on the rear terminal panel covered with a stick-on silver plastic film.

U5 has a standard D9 male connector on the rear. U7 has 9-pin mini-DIN. Connections are the same for all four ranges.

Function/Direction	T460 proj. Connection	Plus "Control" Port 9-pin D-sub	Plus "Control" Port mini-DIN 9 pin	
Ground	Ground	9-pin D-sub pin 5	9pin mini-DIN Pin 4	 Mini-DIN 9 solder side
Data from T460 to projector	Tx	9-pin D-sub pin 3 (RXD)	9-pin mini-DIN, Pin 1 (RXD)	
Reply data from projector to T460	Rx	9-pin D-sub pin 2 (TXD)	9-pin mini-DIN, Pin 7 TXD)	
Plus 9 volt CTS/DTR to projector	N/C	N/C	N/C	

After installation wiring of any projector to a T460, use a multimeter to check voltages of –9 on BOTH TX and RX pins in any installation, as described in the troubleshooting part of this manual.

Projection Design … ASCII and Binary code sets

Projection Design … ASCII code set SIS (Simple Instruction Set): F12, FR12, F22, F32, FL32, F80, F82 (Shows on LCD screen as "**Proj. Design**" "**F12-F82**".)

The following table shows the mapping of T460 channel number, the string sent, and the input associated with that channel in the manual, and how it is identified on the on-screen menu:

T460 Channel	TX string	Input name in manual	Function as identified on screen
1	:IVGA'<CR>	VGA	VGA
2	:IDVI<CR>	DVI-I	DVI-A, DVI-D
3	: ICVI <CR>	C-Video	Composite Video
4	: ISVI <CR>	S-VIDEO	S-Video
5	: IYPP <CR>	YPbPr	Component Video
6	: IRGS <CR>	RGB Video, (3 lines on Component inputs and separate Sync on Composite Video input)	(Some only)
7	: IHDM <CR>	HDMI	(Some only)
8	: IBNC <CR>	BNC	(Some only)

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

No audio control is provided with this command set, but these projectors don't have audio inputs, anyhow. If a Volume keyboard is used, a T461 is needed.

Disable "Source Scan" in the Settings menu.

Aspect ratio control is included. Use source names: "Set reg 4:3" and "Set reg 16:9".

MuteOn/Mute Off and Freeze On/Off and Mute On/Off keyboards are supported, and work normally.

Note: Some projectors appear to support both the SIS (ASCII) and the following 32-byte binary protocol. We suggest you try the ASCII protocol first, as it supports lamp hour display and Reply mode with projector state sensing.

Projection Design … Binary: Action! (etc), eCinema (etc), evo (etc), F1 (etc), F2 (etc) and F3)

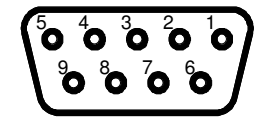
The following table shows the mapping of T460 channel number, the string sent, and the input associated with that channel in the manual, and how it is identified on the on-screen menu:

T460 Channel	17th byte of 32-byte message	Connector / function
Channel 1	00h	VGA 1
Channel 2	01h	VGA 2
Channel 3	02h	DVI
Channel 4	03h	Video Component
Channel 5	04h	S-Video
Channel 6	05h	Video Composite
Channel 7	06h	Video Component HD

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs in the above table.

RS232 connections to all ProjectionDesign, Christie DS30, DS+25, Matrix 1500

To connect the T460 to these projectors use a DB9 male on the cable: Communication is at 19200 8N1

Function/Direction	T460 "projector" Connection	Projector Connector (Male on cable)	 D-sub 9 male solder side
Ground	Ground	9-pin D-sub pin 5	
Data from T460 to projector	Tx	9-pin D-sub pin 3 (RXD)	
Reply data from projector to T460	Rx	9-pin D-sub pin 2 (TXD)	
Plus 9 volt CTS/DTR to projector	N/C	N/C	

After installation wiring of any projector to a T460, use a multimeter to check voltages of –9 on BOTH TX and RX pins in any installation, as described in the troubleshooting part of this manual.

Promethean: (Electronic WhiteBoard manufacturer also selling projectors)

PRM-10, PRM-20 are Sanyo-manufactured units which are covered by **Sanyo/Eiki Group 12.** See these for details.
PRM-25, 35, EST-P1: These are similar to: **Optoma: Group 4:** EP771/772/774, Planar: PR5020, BenQ: SP820. See these for details.
PRM-30 is a Sanyo-manufactured unit which are covered by **Sanyo/Eiki Group 16.** See these for details.

Proxima projector:

DP6150/55, ASK C20/C60/C85/C90/C95/C100/C105, InFocus LP280/290 projectors

This range of Proxima projectors has been removed from the manual to save paper, although they are in the T460 controller data base. If the setup notes are needed, please download code release 2.88, Part B, from JED's site.

Samsung LCD panel:

Samsung Generic1: SyncMaster (320/400/460 M/P/Pn*) and newer series: DB, DE, DH, DM, EDxxC, EDxxD, H, LE, ME, PE, UD and UE.

The following table shows the mapping of T460 channel number, the string sent, and the input associated with that channel in the manual, and how it is identified on the on-screen menu. Aspect ratio control is provided via dummy channel names called: "Set reg 4:3" and "Set reg 16:9". Audio Mute is provided. (no Picture Mute). Freeze is NOT supported.

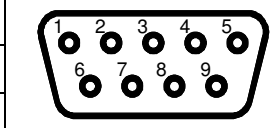
In rev 3.74, ALL strings sent have been changed to have 0FEh as the third byte (rather than 0FFh in previous versions), so that strings can address all units simultaneously via the "daisy-chain" connection of RS232 inputs and outputs.

T460 Channel	TX code 5th byte FlagJ=0	TX code 5th byte FlagJ=1	Input name in manual (and on screen)
1	014H	014H	PC
2	022H	01EH	HDMI 1 (BNC if FlagJ=1)
3	031H	018H	HDMI 3 (DVI if FlagJ=1)
4	00CH	00CH	AV (Composite Video)
5	008H/025H	008H/025H	Component (FlagK=0), DisplayPort (FlagK=1)
6	021H	021H	HDMI 1
7	023H	023H	HDMI 2 (some only)
8	020H/050h	020H/050h	Magic-Net (FlagV=0), Plug In Module (FlagV=1)

Note: An addressing scheme is used to send data to a selected LCD panel. A default address of 0xFF is assumed here.

RS232 connections to Samsung SyncMaster LCD panel 400/460 with D9

Comms is at 9600 baud, 8 bits, no parity, 1 stop. These use a 9-pin-D9 male on the LCD, female on cable

Function/Direction	T460 "projector" Connection	"Serial" Port Connector	 D-sub 9 female solder side
Ground	Ground	9-pin D-sub pin 5	
Data from T460 to projector	Tx	9-pin D-sub pin 2	
Reply data from projector to T460	Rx	9-pin D-sub pin 3	
Plus 9 volt CTS/DTR to projector	n/c	n/c	

After installation wiring of any projector to a T460, use a multimeter to check voltages of –9 on BOTH TX and RX pins in any installation, as described in the troubleshooting part of this manual.

Sanyo LCD:

42/47XR7 (XR2 deleted)

T460 Channel	Command	Input	Function (group 1)
1	<02>INP:6<03>	DB15	VGA
2	<02>INP:2<03>	DB15	YPbPr (Component)
3	<02>INP:1<03>	RCA & DIN 4	AV, Video (Composite) & S-Video (S-Video has priority)
4	<02>INP:3<03>	SCART 1	SCART 1 (Composite Video via RCA on adaptor)
5	<02>INP:4<03>	SCART 2	SCART 2 (Composite Video via RCA on adaptor)
6	<02>INP:5<03>	SCART 2	SCART 2 (S-Video via DIN 4 on adaptor)
7	<02>INP:7<03>	HDMI 1	HDMI 1
8	<02>INP:8<03>	HDMI 2	HDMI 2

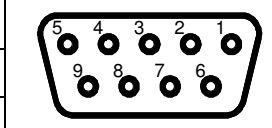
Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

Notes: There is no "video mute" or "Blank" on this panel, but there is an Audio mute. Two-yellow-button mute mode ONLY mutes Audio. Don't use a Mute On/Mute Off keyboard, but if Freeze is needed, use the Freeze/Mute keyboard, but ONLY the Freeze On/Off function works.

There is provision for support of the **Aspect Ratio** control commands. A dummy channel **"4:3/16:9/Zm."** allows moving between 4:3 and 16:9 and Zoom screen images.

RS232 connections to Sanyo LCD42/47XR7 panel

These use a 9-pin-D9 female on the LCD, male on cable. Comms is at 9600 baud, 8 bits, no parity, 1 stop. Reply mode OK.

Function/Direction	T460 "projector" Connection	"Serial" Port Connector	 D-sub 9 male solder side
Ground	Ground	9-pin D-sub pin 5	
Data from T460 to projector	Tx	9-pin D-sub pin 3 (RXD)	
Reply data from projector to T460	Rx	9-pin D-sub pin 2 (TXD)	
Plus 9 volt CTS/DTR to projector	N/c		

Sanyo projector: (Inc. some Eiki, Christie, Philips, Promethean)
Philips projectors: (PXG30, LC1341, LC1345) / 7320/ 7325/ 7350/ 7355,

(For **Eiki EIP-200/1000/1600/2500/3000/3500/4500/S200/X200/X350** see Sharp.)

The Sanyo range has a very confusing input channel allocation, and these differ from projector to projector, in ways that defy imagination! A number of "inputs" are grouped as an "Input", so for a computer input you might have a HD DB15 (VGA analog), a DVI and a DVI (High-bandwidth Digital Content Protection (HDCP), all called "Input 1". On some Sanyo models these are mutually exclusive, and you can only have one of these, and they are selected by a command string, but ONLY ONE CAN BE FED TO THE PROJECTOR AT ONCE. On other Sanyo/Eiki projectors, there are up to 8 input commands, and selection between these multiple sources fed to one input can be made with command strings. YOU MUST SELECT THE APPROPRIATE T460 CHANNEL; OTHERWISE THE DEVICE WILL NEVER BE SELECTED.

In a similar way, some Sanyo devices have "Composite Video", "Component video" and "S-Video" inputs all called as one input, eg. "Input 3" or "Video". If the projector has extended codes to differentiate between them, they can be remotely selected by a T460 (Groups 2 … 15). If they don't, only manually preselected inputs for Inputs 1, 2 and 3 can be selected.

For a limited number or projectors there are other codes and they are covered in separate tables below. So if the projector you are driving is **NOT** in groups 2 to 15, use group 1 which follows, and be prepared to try all 8 channels/codes to select the particular ones needed. (Set all unused ones to "skip"). What each code selects in a particular projector varies, and needs to be determined experimentally, or by comparing codes shown in the second column of the "Group 1" table with ones in your projector manual. (Just trying is probably easier!)

Most in these groups have a HEX mode for lamp time display. Group 6 and 10 is decimal. If any others are decimal, set FLAG4. Check T460 hours display (at startup) matches projector hour. Check display count has no gaps.

If two or more lamps are used, the T460 will read out all provided, and show these in a sequence of 2 second displays, as many as necessary, labelled by lamp number 1 .. 4.

Note: If using channels scattered over the range 1 to 8 and a T461 is used, the T461 links menu allows, for instance, channels 1, 5 and 8 to be allocated to T461 channels 1, 2, and 3.

Note: Users can set FlagG (see flag setup menu) to enable sending "C89<0Dh>" (Auto Image) after each source transmission to these model projectors. (was Flag1)

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Note: With some Sanyo/Eiki projectors, you must turn the "Input Search" to "OFF".

Note: With some Sanyo/Eiki projectors, you need to disable the timed power-down function.

Note: Some Sanyo projectors recently have an "Eco" mode … this is a low power standby mode, and must be disabled for RS232 coms to work to start the projector.

Set the projector to "Network" under the "Setting->Power management->Standby"

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Sanyo/Eiki Group 1, default if not in groups below.

T460 Channel	String sent	Input	Function (group 1)
1	C05	1	INPUT1 ANALOG MODE SET (HD DB15 VGA)
2	C06	2	INPUT2 RGB MODE SET
3	C07	2	INPUT2 VIDEO MODE SET (COMPOSITE)
4	C08	3	INPUT3 VIDEO MODE SET (COMPOSITE)
5	C22	1	INPUT1 DIGITAL MODE SET (DVI)
6	C24	3	INPUT3 S-VIDEO MODE SET
7	C25	2	INPUT2 Y, Pb/Cb, Pr/Cr SET (COMPONENT)
8	C26	3	INPUT3 Y, Pb/Cb, Pr/Cr SET (COMPONENT)

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

Sanyo/Eiki Group 2 Sanyo PLC-XP41/XP46, PLV-70, Christie LW25/LX33/LX41, Eiki LC-X986/X1100

T460 Channel	String sent	Input	Function (group 2)
1	CF INPUT1 ANALOG	1	INPUT1 ANALOG MODE SET (HD DB15 VGA)
2	CF INPUT2 ANALOG	2	INPUT2 RGB MODE SET
3	CF INPUT2 VIDEO	2	INPUT2 VIDEO MODE SET (COMPOSITE)
4	CF INPUT3 VIDEO	3	INPUT3 VIDEO MODE SET (COMPOSITE)
5	CF INPUT1 DIGITAL	1	INPUT1 DIGITAL MODE SET (DVI)
6	CF INPUT3 S-VIDEO	3	INPUT3 S-VIDEO MODE SET
7	CF INPUT2 YPBPR	2	INPUT2 Y, Pb/Cb, Pr/Cr SET (COMPONENT)
8	CF INPUT3 YPBPR	3	INPUT3 Y, Pb/Cb, Pr/Cr SET (COMPONENT)

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

Sanyo/Eiki Group 3 Sanyo PLC-XT10/XT11/XT15/XT16, Christie LX32, Eiki LC-XG100/XG110/XG200/XG210

T460 Channel	Strings sent (One or both)	Input	Function (Group 3)	Application
1	CF INPUT1	1	Input 1 Analog VGA	DB15 VGA Computer analog 1 or SCART (Some Christie)
2	CF INPUT2 CF SOURCE ANALOG	2	Input 2 Analog VGA	DB15 VGA Computer analog 2
3	CF INPUT2 CF SOURCE DIGITAL	2	Input 2 Digital	DVI
4	CF INPUT3 CF SOURCE VIDEO	3	Input 3 Composite Video	RCA Video
5	CF INPUT3 CF SOURCE YPBPR	3	Input 3 Component Video	Component Video
6	CF INPUT3 CF SOURCE S-VIDEO	3	Input 3 S-Video	S-Video

Sanyo/Eiki Group 4 Sanyo PLV-60 HT, Christie LX26/LX35.

Separate commands are provided FOR ALL CHANNELS

T460 Channel	String sent	Input	Function (group 4)
1	C05	1	INPUT1 (Computer RGB analog on DB15 or DVI as preset)
2	C06	2	INPUT2 RGB (BNC)
3	C07	2	INPUT2 VIDEO MODE SET (COMPOSITE) BNC
4	C08	3	INPUT3 VIDEO MODE SET (COMPOSITE) RCA
5	C23	2	INPUT2 S-VIDEO (Not Christie)
6	C24	2	INPUT2 Y/C (S-Video Input 3 on Christie)
7	C25	2	INPUT2 Y, Pb/Cb, Pr/Cr SET (COMPONENT) BNC
8	C26	3	INPUT3 Y, Pb/Cb, Pr/Cr SET (COMPONENT) RCA

Sanyo/Eiki Group 5, Sanyo PLC-SC10/XC10, PLC-SU60/XU60, PLV-75, PLV-80

Separate commands are provided FOR ALL CHANNELS. The table below shows how these are allocated. **SEE IMPORTANT WIRING NOTE RE CTS/RTS ON THESE IN FOLLOWING RS232 CONNECTION NOTES.**

T460 Channel	String sent	Input	Function (group 5)
1	C50	1	INPUT1 ANALOG RGB (via HDB 15 VGA to DVI cable)
2	C52	1	INPUT1 DVI-Digital (via DVI-Digital cable to PC)
3	C53	1	INPUT1 A/V input HDCP (via DVI to 5 RCA or DVI-DVI cable) HDCP = "High-bandwidth Digital Content Protection"
4	C25	2	INPUT2 ANALOG RGB (via HDB 15 VGA connector/cable)
5	C26	2	INPUT2 ANALOG RGB (via SCART-VGA cable)
6	C33	3	INPUT3 VIDEO (composite) mode set via RCA connector
7	C34	3	INPUT3 S-Video into S-Video DIN sub connector
8	C35	3	INPUT3 Y, Pb/Cb, Pr/Cr SET (COMPONENT)

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

Sanyo/Eiki Group 6, Sanyo PLC-SU50, PLC-SE20, PLC-SL20, PLC-SU51, PLC-SU55, PLC-WXU30, PLC-XC50, PLC-XC55, PLC-XE20, PLC-XL20, PLC-XU25, PLC-XU50, PLC-XU56 PLC-XU58, PLC-XU83, PLC-XU84, PLC-XU86, PLC-XU87, PLC-XU88, PLC-XU100, PLC-XU101, PLC-XU110, PLC-XU111 PLC-XU115.
Eiki LC-SB20, LC-SB21, LC-XB20, LC-XB21, LC-XB25, LC-XB26, LC-XB27, LC-XB29, LC-XB30, LC-XB40, LC-XB41, LC-XS25, LC-XS30 Christie-LX25

Group 18: (* below) PLC-XU105, Eiki XB42

Group 22: (** below) PDG-DXL100, PDG-DWL100, PDG-DSU30 (audio 0-10)

Separate commands are provided FOR ALL CHANNELS. **SEE IMPORTANT WIRING NOTE RE CTS/RTS ON THESE MODELS IN FOLLOWING RS232 CONNECTION NOTES.**

T460 Channel	String sent	Input	Function (group 6)
1	C50/C05* **	1	INPUT1 ANALOG RGB (via DVI to HDB 15 VGA cable)
2	C52/C06* **	1	INPUT1 DVI-Digital (via DVI-Digital cable to PC)
3	C53/C07*/ C35**	1	INPUT1 A/V input HDCP (via DVI to 5 RCA or DVI-DVI cable) HDCP = "High-bandwidth Digital Content Protection"
4	C24	2	INPUT2 Component Y, Pb/Cb, Pr/Cr (via VGA to Comp cable)
5	C25/ C04**	2	INPUT2 ANALOG RGB (HDB 15 VGA) / **HDMI
6	C26	2	INPUT2 SCART (via VGA to SCART 21pin cable)
7	C33	3	INPUT3 Composite Video (RCA)
8	C34	3	INPUT3 S-Video

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

Sanyo/Eiki Group 7, Sanyo PLV-Z1/Z2, Christie LX20.

Separate commands are provided FOR ALL CHANNELS.

T460 Channel	String sent	Function (group 7)
1	C05	Computer Input: ANALOG RGB (HDB 15 VGA)
2	C07	AV mode … probably will not be used … use 3/4/5 (Not LX20)
3	C08	Computer Input: DVI-Digital (Not PLV-Z1, -Z2)
4	C23	Composite Video on RCA
5	C24	S-Video input on DIN 4
6	C25	Component Y, Pb/Cb, Pr/Cr (via 3-RCA)

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

Sanyo/Eiki Group 8, **Sanyo** PLC-ET30L, PLC-XM100/L, PLC-XM150/L, PLC-XP50, PLC-XP51, PLC-XP55, PLC-XP56, PLC-XP57, PLC-XP100, PLC-XP200, PLC-XT20, PLC-XT21, PLC-XT25, PLC-XT35, PLC-XTC50
Christie LW300, LX37, LX40, LX45, LX50, LX55, LX380, LX450, LX650,
Eiki LC-W3, LC-X60, LC-X70, LC-X71, LC-X80, LC-X85, LC-XG250, LC-XG300, LC-XG450, LC-XL100, LC-XL200, LC-SXG400L, LC-XGC500, LC-SXG400L,

Separate commands are provided FOR ALL CHANNELS.

T460 Channel	String sent	Input	Function (group 8)
1	C50	1	INPUT1 ANALOG RGB HDB 15 VGA
2	C52	1	INPUT1 DVI-Digital
3	C53	1	INPUT1 A/V input HDCP (via DVI to 5 RCA or DVI-DVI cable) HDCP = "High-bandwidth Digital Content Protection"
4	C23	2	INPUT2 Composite Video (via 1 BNC)
5	C24	2	INPUT2 Component Y, Pb/Cb, Pr/Cr (via 3 BNC)
6	C25	2	INPUT2 Computer (via 5 BNC)
7	C33	3	INPUT3 Composite Video (RCA)
8	C34	3	INPUT3 S-Video

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

Sanyo/Eiki Group 9 PLC-SU/XU32 (This is a weird one, as theoretically SU/XU32 will NOT use codes past C07, but it DOES!) SAN PDG-DTW50L/KL, PDG-DXT10L (see* below)

T460 Channel	String sent	Input	Function (group 9)
1	C05	1	INPUT1 ANALOG MODE SET (HD DB15 VGA) / *Computer 1
2	C06	2	INPUT2 RGB MODE SET / *Computer 2
3	C07	2	INPUT2 VIDEO MODE SET (COMPOSITE) / *Computer 3
4	C08	3	INPUT3 VIDEO MODE SET (COMPOSITE) / *Component
5	C25*	2	INPUT2 ANALOG RGB (HDB 15 VGA) *Not DTW-50/DXT10-L
6	C26*	2	INPUT2 SCART (via VGA to SCART cable) *NotDTW-50/ DXT10-L
7	C33	3	INPUT3 Composite Video (RCA)
8	C34	3	INPUT3 S-Video

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

Sanyo/Eiki Groups 10, Sanyo PLC-SU70, PLC-SW30, PLC-SW35, PLC-XE31, PLC-40, PLC-50, XL40, PLC-XL50, PLC-XU41, PLC-XU47, PLC-XU48, PLC-XU51, PLC-XU70, PLC-XU73, PLC-XU74, PLC-XU75, PLC-XU78, PLC-XU305, PLC-XU355,

Eiki LC-SB22, LC-XB22, LC-XB23, LC-XB24, LC-XB28, LC-SD10, LC-SD12, LC-SD15,

Group 16: (* below), **Sanyo:** PLC-XC56, PLC-XU305, PLC-XU355, PLC-XW50, PLC-XW55, PLC-XW56, PLC-XW57, PLC-XU116, **Eiki** LC-XA20, LC-XB21, LC-XB100, LC-XB200.

Group 17: (** below) **Sanyo:** PLC-WL2500, PLC-WL2501, PLC-WK2500, PLC-XE32, PLC-XK2200, PLC-XK2600, PLC-XK3010, PLC-XU106, PLC-XU300, PLC-XU350, PLC-XU4000, PLC-XW56, PLC-XW60, PLC-XW65,
Eiki LC-XB21B**,** LC-XD25, LC-XB43, LC-WS250

Group 19: (** below) **Sanyo:** PLC-XW200, PLC-XW250, PLC-XW300, PLC-XD2200, PLC-XD2600, **Eiki:** LC-XBL20, LC-XBL21, LC-XBL25, LC-XBL26 (audio 0-31)
Group 21: (***, **, * below), **Sanyo:** PDG-DWL2500, PDG-DXL2000, PLC-WXU300/WXU350, PLC-WXU700, **Panasonic:** CW230,CX200, **Canon:** LV8235UST**, Eiki** LC-WB42N, LC-WB100, LC-WB200, **Promethean** PRM-30****.

T460 Channel	String sent	Input	Function (group 10)
1	C50	1	INPUT1 ANALOG RGB HDB 15 VGA
2	C51/ C54*/C04 ****	1	INPUT1 SCART (via VGA to SCART 21pin cable) **** HDMI
3	C54/C06*	1	INPUT1 Component Y, Pb/Cb, Pr/Cr
4	C25/C06 **,****	2	INPUT2 Analog RGB (HDB 15 VGA) ** XE32, XW60, XW65, PLC-XU106, LC-XB43
5	C33 */C07 **,****	3	INPUT3 Comp Video (RCA) * XW50/55/56, XA20, XW60, XW65, **PLC-XU106, LC-XB43, PLC-XU116
6	C34	3	INPUT3 S-Video (on some, via HDB 15 VGA connector)
7	CF INPUT VIDEO	3	Video Absolute or DVI PC Digital, code C5B<CR>
8	CF INPUT S-VIDEO	3	S-Video Absolute or DVI (AV HDCP) code C5C<CR>

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

Sanyo/Eiki Group 11, Eiki LC-X50, LC-X50M.

T460 Channel	String sent	Input	Function (group 11)
1	C50	1	INPUT1 ANALOG RGB HDB 15 VGA 1
2	C51	1	INPUT1 SCART (via VGA to SCART 21pin cable)
3	C25	2	INPUT2 ANALOG RGB HDB 15 VGA 2 (Must be enabled as IN)
4	C33	3	INPUT3 Composite Video (RCA)
5	C35	3	INPUT3 Component Y, Pb/Cb, Pr/Cr (via 3 RCA)
6	C81	4	INPUT4 Composite Video (RCA)
7	C82	4	INPUT4 S-Video
8	C83	4	INPUT4 Component Y, Pb/Cb, Pr/Cr (via 3 RCA)

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.
Note: Audio output must be enabled to "Audio 2" connector to get controlled and switched audio OUT.

Sanyo/Eiki Group 12, SAN PLC-WXE45, PLC-WXE46, PLC-WXL46 , PLC-XL51, Eiki SE/XE10, XB31, XB33 projectors. Promethean PRM-10, PRM-20

Separate commands are provided FOR ALL CHANNELS. The table below shows how these are allocated. **SEE WIRING NOTE RE CTS/RTS ON THESE MODELS IN FOLLOWING RS232 CONNECTION NOTES.**

T460 Channel	String sent	Input	Function (group 12)
1	C50	1	INPUT1 ANALOG RGB (via HDB 15 VGA to DVI cable)
2	C52	1	INPUT1 DVI-Digital (via DVI-Digital cable to PC)
3	C53	1	INPUT1 A/V input HDCP (via DVI to 5 RCA or DVI-DVI cable)
4	C06	2	INPUT2 ANALOG RGB (via HDB 15 VGA connector/cable)
5	C33	3	INPUT3 VIDEO (composite) mode set via RCA connector
6	C34	3	INPUT3 S-Video into S-Video DIN sub connector
7	C35	3	INPUT3 Y, Pb/Cb, Pr/Cr SET (COMPONENT)
8	C54	1	INPUT1 Y, Pb/Cb, Pr/Cr SET (COMPONENT)

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

Sanyo/Eiki Group 13, **Sanyo**, PDG-DET100, PDG-DHT100L, PLC-EF60,PLC-XF47, PLC-XF60, PLC-XF70, PLC-XF71, PLC-XF1000, PLC-XR70,PLV-WF20,PLV-HD150, PLV-HD2000, **Christie**: LS-PLUS-58, LW600, LX66, LX900,
Eiki: EIP-DHT20, EIP-SXG20, LC-SX6, LC-W5, LC-X6, LC-X7, LC-X8, LC-XT5

T460 Channel	String sent	Function (group 13)
1	C05	INPUT1
2	C06	INPUT2
3	C07	INPUT3
4	C08	INPUT4
5	C03	INPUT5
6	C04	INPUT6

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

Sanyo/Eiki Group 14, Sanyo PLV-1080HD, PLV-Z3, PLV-Z4, PLV-Z5, PLV-Z700, PLV-Z800, PLV-Z2000, PLV-Z3000, PLV-Z4000

T460 Channel	String sent	Input	Function (group 14)
1	C50	Computer	ANALOG RGB (via DVI to HDB 15 VGA cable)
2	C51	Computer	SCART (via VGA to SCART 21pin cable)
3	C53	HDMI 1	High-Definition Multimedia Interface
4	C54	HDMI 2	High-Definition Multimedia Interface
5	C23	Video	Composite Video RCA
6	C24	Video	S-Video
7	C25	Video	Component Video 1
8	C26	Video	Component Video 2

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

Sanyo/Eiki Group 15, EIKI LC-XB27NAlt / Sanyo PLC-XU86Alt, Eiki LC-XB33NAlt / Sanyo PLC-XU88Alt, Eiki LC-XB42NAlt / Sanyo PLC-XU115Alt, Sanyo PLC-XU110Alt, XU111Alt, PLC-WXU30Alt **(Alternate channel allocation from Group 6 inc wireless)**

SEE IMPORTANT WIRING NOTE RE CTS/RTS ON THESE MODELS IN FOLLOWING RS232 CONNECTION NOTES.

T460 Channel	String sent	Input	Function (group 15)
1	C50	1	INPUT1 ANALOG RGB (via DVI to HDB 15 VGA cable)
2	C24	2	INPUT2 Component Y, Pb/Cb, Pr/Cr (via VGA to Comp cable)
3	C25	2	INPUT2 ANALOG RGB (HDB 15 VGA)
4	C33	3	INPUT3 Composite Video (RCA)
5	C34	3	INPUT3 S-Video
6	C81		INPUT WIRED (Some only)
7	C82		INPUT WIRELESS
8	C83		INPUT VIEWER (Some only)

Sanyo/Eiki Group 20, **Sanyo:** PLC-WM4500, PLC-WM5500, PLC-WTC500L, PLC-ZM5000, **Eiki:** LC-HDT700, LC-WGC500

Separate commands are provided FOR ALL CHANNELS.

T460 Channel	String sent	Input	Function (group 8)
1	C50	1	INPUT1 ANALOG RGB HDB 15 VGA
2	C4F		HDMI
3	C25	2	INPUT2 Computer (via 5 BNC)
4	C24	2	INPUT2 Component Y, Pb/Cb, Pr/Cr (via 3 BNC)
5	C23	2	INPUT2 Composite Video (via 1 BNC)
6	C33	3	INPUT3 Composite Video (RCA)
7	C34	3	INPUT3 S-Video
8	C08		INPUT Network

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

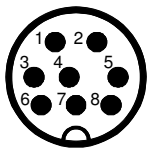
RS232 connections to Sanyo, Eiki, Christie LX25, 32, 37, 45 and some Philips

There are three types of connectors used on these families of projectors, and rather than list them here by projector (over 100 types) it is simpler to just list the three connection schemes, and then allow users to choose one from the three tables for the appropriate connector after physically examining the projector of checking the projector user manual. After installation wiring of any projector to a T460, use a multimeter to check voltages of –9 on BOTH TX and RX pins in any installation, as described in the troubleshooting part of this manual.

While it does not appear that CTS is ever needed on almost all projectors in this family, some list it on DIN8, Pin 5, and IT IS DEFINITELY NEEDED ON THE NEWER PLC-SC/XC10 MODELS. We hence recommend that all installations actually wire this line in, to allow for what may be a future trend in this family as projectors are updated.

8-Pin DIN circular connector group: Comms at 19200 baud, 8N1.

Function/Direction	T460 "projector" Connection	Control Port Connector
Ground	Ground	8-pin DIN pin 4, (maybe 7, 8 as well)
Data from T460 to projector	Tx	8-pin DIN pin 1 (RXD)
Reply data from projector to T460	Rx	8-pin DIN pin 6 (TXD)
Plus 9 volt CTS/DTR to projector	CTS	8-pin DIN pin 5 (CTS/RTS)



Mini-DIN 8 solder side

12-Pin DIN circular connector group: Comms at 19200 baud, 8N1

Function/Direction	T460 "projector" Connection	Control Port Connector
Ground	Ground	12-pin DIN pin 9
Data from T460 to projector	Tx	12-pin DIN pin 2 (RXD)
Reply data from projector to T460	Rx	12-pin DIN pin 3 (TXD)

9-Pin D sub min. connector group: Comms at 19200 baud, 8N1.

Function/Direction	T460 "projector" Connection	Control Port Connector
Ground	Ground	9-pin D sub min pin 5 (Ground)
Data from T460 to projector	Tx	9-pin D sub min pin 2 (RXD)
Reply data from projector to T460	Rx	9-pin D sub min pin 3 (TXD)

Sanyo: PLC-WXU10N

This is a completely non-typical projector from Sanyo, using different connectors, hex codes (BE EF etc), etc.
The following table shows the mapping of T460 channel number, the string sent, and the input associated with that channel in the manual, and how it is identified on the on-screen menu.

T460 Channel	TX code, 8th byte	Input	Function on screen
1	32h	DB15 Analog RGB	Computer
2	36h	DVI	Digital
3	35h	RCA composite video	Composite Video
4	34h	DIN-4 S-Video	S-Video
5	33h	3-RCA component	Component

The "Input search" function MUST be disabled.

Audio is limited: there is only one stereo RCA input, and NO audio output. There is control (incremental, 0->100 NOT 0->60 as the manual says) via the RS232 control, but only to the rather weak internal speaker. Use a T461 if better audio is needed.

Freeze and mute (pic and sound) are supported, but toggle only with the "Freeze/Mute" keyboard, but no 2-yellow-button mute is provided with a "Volume" keyboard as the projector codes cannot command absolutely or read back the mute state.

Aspect ratio control is provided, and is done by setting the dummy channel, say, Ch 8, to "4:3/16:9/Zm.". Moving to this "dummy" channel will roll the aspect ratio through 4:3 option, a full screen, and 16:9.

Users can set FlagG=1 (see flag setup menu) to enable sending Automatic Pixel Align after each source transmission.

No “Projector Coms OK” message is available from the projector in Standby, and no “lamp hours” is available.

RS232 connections to Sanyo PLC-WXU10N

To connect the T460 to these projectors use a mini-DIN 6 male on the cable: Comms is at 19200 baud 8N1.

Function/Direction	T460 “projector” Connection	Projector Connector 6-pin mini-DIN
Ground	Ground	Mini-DIN Pins 1, 2
Data from T460 to projector	Tx	Mini-DIN Pin 3 (RXD)
Reply data from projector to T460	Rx	Mini-DIN Pin 5 (TXD)
Plus 9 volt CTS/DTR to projector	N/C	N/C

Mini-DIN 6
solder side

Note: The signal input and output of this projector has clamp diodes and never goes below –0.7 volts or over +5.7 volts, even when connected to the T460.

Sharp projectors: (Inc some Eiki EIP family)

Communications is at 9600 8N1, and this may need to be set up in the projector, and RS232 may need to be enabled. (This is in the “Options(2)” menu under “LAN/RS232”. Set to “Enable”.) Also, Auto channel change, if present, will need to be disabled. Freeze (SOME ONLY…check with JED) and Mute On/Mute Off keyboards are supported.

* In table is for SHARP DT-400, XV-Z2000, EIKI EIP-1500;
** In table is for Eiki EIP-S200, X200, X350;
*** In table is for Sharp XV-Z10 (IASI commands select mode on Input 1)

Eiki in “Default” include: EIP-200, EIP-250, EIP-1000, EIP-1500, EIKI-EIP-1600, EIP-2500, EIP-2600, EIP-3000, EIP-3500, EIP-4200, EIP-4500, EIP-S200, EIP-X200, EIP-X350, EIP-WX5000/L

T460 Channel	Default	*	**	***	Function
1	IRGB 1	IVED 1	IRGB 1	IRGB 1	RGB inputs are used for both Computer and Component RGB sources. Sharp/Eiki have varying numbers of RGB inputs, from 1 to 4. Test on site and skip unused channels.
2	IRGB 2	IVED 2	IVED 1	IASI 1	
3	IRGB 3	IVED 3	ISEV 1	IASI 2	
4	IRGB 4	IVED 4	ICMP 1	IVED 1	
5	IVED 1	IVED 5	IDVI 1	IVED 2	Video inputs are called various names on screen, and can vary from 2 to 6. Test on site and skip unused channels. **NOTE: You will have to set up “Channels” in the second setup menu to get “Video”.**
6	IVED 2	IVED 6			
7	IVED 3				
8	IVED 4				

Don’t forget to set all unused T460 channels to “Skip” to jump over blank/unused inputs.

The driver routines provide for audio setting via the projector, showing a range of 0 … 20 on the display, mapping to 0 … 60 on the projector volume display function. (Not for Eiki EIP-S200, X200, X350) If a T461 is selected, don’t forget to map the channels using the map T461 option in the setup screen.

Audio note: On some Sharp projectors there is a selection menu item allowing the “Audio Output” to be selected to be controlled or un-controlled by the audio volume commands. If controlling the system audio via the projector (i.e. no T461 used) you would select the VAO, “Variable Audio Output” mode. If using a T461, select FAO, “Fixed Audio Output” mode. (This is in the “Audio Adjustment” menu.)

Note: Users can set FlagG (see flag setup menu) to enable sending "ADJS 1<0Dh>" (Auto Sync Start) after each source transmission to these model projectors.

Note: Dual lamp readout is automatically provided for projectors with two lamps. Both are shown with labels “1” and “2”.

Aspect ratio control: Aspect ratio control (Not for Eiki EIP-S200, X200, X350) is done by setting the dummy channel, say, Ch 8, to “**4:3/16:9/Zm**.”. Moving to this “dummy” channel will roll the aspect ratio through a small 4:3 option, a full screen 4:3 and 16:9. The code varies by channel (RGB or Video) and corresponds to codes in the manual, and is displayed with a **“Screen aspect ratio”** and a code number.

RS232 connections to Sharp/Eiki projectors

These use a D-sub 9-pin connector, female or male on cable: (May be via an adaptor cable from projector 9-pin mini-DIN)

Function/Direction	T460 "projector" Connection	Sharp Control Port Connector, D-sub 9	Sharp Control Port Connector DIN 9
Ground	Ground	9-pin D-sub pin 5	9-pin D-sub pin 5
Data from T460 to projector	Tx	9-pin D-sub pin 2	9-pin D-sub pin 2
Reply data from projector to T460	Rx	9-pin D-sub pin 3	9-pin D-sub pin 3
Plus 9 volt CTS/DTR to projector	CTS	unused	unused

After installation wiring of any projector to a T460, use a multimeter to check voltages of –9 on BOTH TX and RX pins in any installation, as described in the troubleshooting part of this manual.

RS232 connections to Eiki EIP-S200, X200, X350 *** note: still in testing

Note: For these projectors, no "Projector Coms OK" message is available from the projector in Standby, and no "lamp hours" is available. A **latch-up** mode can occur in the projector which can only be cleared by an AC power down an up via the switch.

To connect the T460 to these projectors use a mini-DIN 6 male on the cable:

Function/Direction	T460 "projector" Connection	Projector Connector 6-pin mini-DIN
Ground	Ground	Mini-DIN Pins 1, 2
Data from T460 to projector	Tx	Mini-DIN Pin 3 (RXD)
Reply data from projector to T460	Rx	Mini-DIN Pin 5 (TXD)
Plus 9 volt CTS/DTR to projector	N/C	N/C

Mini-DIN 6
solder side

Note: The signal input of these projectors has a clamp diode and never goes below –0.7 volts, even when connected to the T460. Voltage out from projector is a normal –5 to –9 volts.

Sharp LCD screens:

LC-M3700, LC-3710

T460 Channel	String sent	Input (on screen)	Function / connection
1	INPS 1<0Dh>	Input1 AV	Composite Video (RCA)
2	INPS 2<0Dh>	Input1 Y/C	S-Video (4-pin DIN)
3	INPS 4<0Dh>	Input2	Composite Video (RCA)
4	INPS 5<0Dh>	Input3 Component	YPbPr / YCbCr / RGB (5-BNC sockets)
5	INPS 6<0Dh>	PC Analog	PC Analog (D SUB 15)
6	INPS 7<0Dh>	PC Digital	PC Digital (DVI)

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

- Freeze is not supported

Sharp LCD screens: SHARP Generic PN1 & PN2

Typical models are: PN-325 / PN-425, PN-465U / PN-G655E, PN-E521 / PN-E601, PN-E421 / PN-E471, PN-S525. Also Mitsubishi LCD (Sharp codes) models LDT651L & P.

Alternate Channel 8 function is provided by choosing PN1 or PN2 option. * and ** shows shared inputs.

T460 Channel	String sent	Input	Function
1	INPS 1<0Dh>	DVI-D *	DVI-D PC digital
2	INPS 2<0Dh>	D-Sub 15	PC Analog
3	INPS 3<0Dh>	Component, BNC x 5 **	YPbPr
4	INPS 4<0Dh>	RCA (& Din4 on PN325/425)	Composite Video & S-Video on PN325/425
5	INPS 6<0Dh>	Analog RGB, BNC x 5 **	Analog RGB (BNC)
6	INPS 7<0Dh>	DVI-D *	DVI-D AV digital
7	INPS 8<0Dh>	Din4 on all but PN325/425	S-Video on all but PN325/425
8	INPS 9<0Dh>	HDMI	AV HDMI **Generic PN1**
8	INPS 10<0Dh>	HDMI	PC HDMI **Generic PN2**

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs. Freeze is not supported.

Sharp LCD screens: SHARP Generic 3, with digital TV on Source 8 (no channel change)

This driver covers over 100 screens, but not the ones requiring a RSPW command to come out of standby.

T460 Channel	String sent	Input	Function / connection
1	IAVD 1<0Dh>	Input 1	All these inputs are allocated to a wide mix of HDMI. Component, S-Video, Composite Video, SCART, DVI and DB15. See the back of each flat panel manual to see allocation. Use the channel setting buttons on the screen for TV channel change.
2	IAVD 2<0Dh>	Input 2	
3	IAVD 3<0Dh>	Input 3	
4	IAVD 4<0Dh>	Input 4	
5	IAVD 5<0Dh>	Input 5	
6	IAVD 6<0Dh>	Input 6	
7	IAVD 7<0Dh>	Input 7	
8	IDTV <0Dh>	TV	DIG TV Tuner

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

Sharp LCD screens: Generic 6 via LAN (e.g. PN60/70TA/B3, via LAN RS232 to LAN adaptor)

This driver communicates through an xDirect RS232 to LAN "dongle" to the panel using TCP communications.

T460 Channel	String sent	Input
1	INPS 2<0Dh>	D-SUB1 (RGB)
2	INPS 10<0Dh>	HDMI 1 (PC)
3	INPS 9<0Dh>	HDMI 1 (AV)
4	INPS 13<0Dh> / INPS 16<0Dh>	HDMI 2 (PC) or D-SUB2 (RGB) if FLAGJ=1 & FLAGK=0
5	INPS 12<0Dh>	HDMI 2 (AV)
6	INPS 18<0Dh>	HDMI 3 (PC)
7	INPS 17<0Dh>	HDMI 3 (AV)
8	INPS 14<0Dh>	DisplayPort

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

Mute is supported but not freeze. Volume goes 0->31.

See JED document:
http://www.jedmicro.com.au/PDF_Docs/Setting%20Up%20LAN%20control%20with%20JED%20controllers%20.pdf

This discusses in detail the setup to the Sharp screen, the xDirect interface, the T460 setup and connections between them.

The HDMI channels seem to have to be setup for PC or AV use. If a channel is commanded to an HDMI-PC the HDMIx PC message appears top right on the screen,(x is HDMI number), even if no signal is present, but if an HDMI-AV channel is selected, the corresponding ID message does NOT appear, even though the panel does switch to it. Weird!

Reply mode is available and works via the PLAN interface, polling the panel every 5 seconds, and closing down the T460R if, for instance, the panel is turned off by the IR remote.

(Warmup does take about 30 seconds, even if a picture does appear after only 5 seconds. The panel has a long startup sequence of some sort of about 25 seconds, sending out "wait" messages every 5 seconds during this time. Don't attempt to shorten this.)

Sharp LCD screens: SHARP Generic 4, Generic 5, (2012/13 "LE" series)

(This group uses different format commands, e.g. Power on is POWR1 <CR> instead of POWR 1<CR>.)

Special note: Sharp panels are now shipped with the RS232 interface disabled as a stand-by power saving measure. There is NO menu item to turn it on … it can only be enabled by a special secret command sequence, to enable what is called "Hotel mode". Call JED or Sharp for details.

Generic 4 drives audio volume range of 0->60, Generic 5 drives audio volume range of 0->100. The Sharp manuals all specify audio on ALL units as 0->60, but field reports indicate some models (at least) are 0->100, so we would appreciate feedback on this. The change of some models to be 0->100 has been confirmed by Sharp.

Some models are: LC-32LE360X LC-40LE360X, LC-40LE530X, LC-46LE530X, LC-60LE630X, LC-60LE640X, LC60-LE650x, LC-70LE650x, LC-40LE700X, LC-60LE632U, LC-70LE632U, LC-70LE732U, LC-70LE735X, LC-40LE830X, LC-46LE830X, LC-52LE830X, LC-60LE632X, LC-40LE835X, LC46LE835X, LC-52LE835X, LC-60LE835X. LC90LE740X, LC-46LE840X, LC-52LE840X, LC-60LE940X, LC-80LE940X (Freeze is not supported)

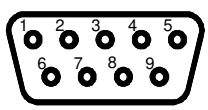
T460 Channel	String sent	Input	Function / connection
1	IAVD1 <0Dh>	Input 1	All these inputs are allocated to a wide mix of 3 or 4 HDMI. Component, Composite Video, and DB15. See the back of each flat panel manual to see allocation.
2	IAVD2 <0Dh>	Input 2	
3	IAVD3 <0Dh>	Input 3	
4	IAVD4 <0Dh>	Input 4	
5	IAVD5 <0Dh>	Input 5	
6	IAVD6 <0Dh>	Input 6	
7	IAVD7 <0Dh>	Input 7	
8	IAVD8 <0Dh>	Input 8	

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

RS232 connections to Sharp LCD screens.

These use a 9-pin-D9 male on the LCD, female on cable. Comms is at 9600 baud, 8 bits, no parity, 1 stop.

Function/Direction	T460 "proj" Con.	"Serial" Port Connector
Ground	Ground	9-pin D-sub pin 5
Data from T460 to projector	Tx	9-pin D-sub pin 2 (RXD)
Reply data from projector to T460	Rx	9-pin D-sub pin 3 (TXD)
Plus 9 volt CTS/DTR to projector	N/c	



D-sub 9 female solder side

After installation wiring of any projector to a T460, use a multimeter to check voltages of –9 on BOTH TX and RX pins in any installation, as described in the troubleshooting part of this manual.

Smart LCD

SBID8055i SBID8070i, LCD panels.

T460 Channel	Command string, BID8055i	Command string, SBID8055i
1	set input=VGA1<CR>	set input=VGA<CR>
2	set input= VGA2<CR>	set input=RGB/HV<CR>
3	set input=Video1<CR>	set input=Video1<CR>
4	set input=DVI<CR>	set input=Video2<CR>
5	set input=DVD/HD1<CR>	set input=DVD/HD1<CR>
6	set input=DVD/HD2<CR>	set input=DVD/HD2<CR>
7	set input=HDMI1<CR>	set input=HDMI1<CR>
8	set input=HDMI2<CR>	set input=HDMI2<CR>

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

Mute and freeze functions are available with these panels. Absolute audio is provided. Connections as below.

Smart projector

INIFI UF55, SLR40wi, UNIFI UX60, UF75 communications via Smartboard to projectors under their control.

Projector manufacturer varies but control strings seem consistent across range.

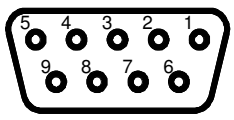
T460 Channel	Command string	Function
1	set input=vga1<CR>	RGB1
2	set input=vga2<CR>	RGB2
3	set input=composite<CR>	Composite Video
4	set input=s-video<CR>	S-Video
5	set input=HDMI<CR>	HDMI

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

Freeze and Mute supported on UF75, UX60, SLR40wi only. Incremental audio control is provided.

RS232 connections to Smart LCD and projectors screens.

These use a 9-pin-D9 female on projector/LCD, male on cable. Comms is at 19200 baud, 8 bits, no parity, 1 stop.

Function/Direction	T460 "projector" Connection	"Serial" Port Connector	
Ground	Ground	9-pin D-sub pin 5	
Data from T460 to projector	Tx	9-pin D-sub pin 3 (RXD)	
Reply data from projector to T460	Rx	9-pin D-sub pin 2 (TXD)	
Plus 9 volt CTS/DTR to projector	N/c		

D-sub 9 male solder side

After installation wiring of any projector to a T460, use a multimeter to check voltages of –9 on BOTH TX and RX pins in any installation, as described in the troubleshooting part of this manual.

Sony projector (old A5/5A codes):

VPL-PX20/21/30/31/32, VPL-VW10/12HT projectors Deleted 3.46. Download 2.88 to use from JED web site.

Sony projector (newer A9-9A codes):

(**Use Generic 1 for unlisted, VPL-CH series, VPL-EX and EW series, VPL-S200, S500 and S600 series**) (VPL-D100 series has no RS232) VPL-BW5, VPL-CW125, VPL-CW255, VPL-CW258, VPL-CW275, VPL-CW278, VPL-CX61, VPL-CX 63, VPL-CX80, VPL-CX85, VPL-CX86, VPL-CX100, VPL-CX120, VPL-CX125, VPL-CX130, VPL-CX131, VPL-CX135, VPL-CX150, VPL-CX155, VPL-CX160, VPL-CX161, VPL-CX165, VPL-CX235, VPL-CX238, VPL-CX275, VPL-CX278, **VPL-ES3***, VPL-ES4, VPL-EW5, VPL-EW7, VPL-EW130, VPL-EW225, VPL-EW226, VPL-EW245, VPL-EW246, VPL-EW275, VPL-EW276, **VPL-EX3***, VPL-EX4, VPL-EX5/U, VPL-EX7, VPL-EX50, VPL-EX70, VPL-EX71N, VPL-EX100, VPL-EX101, VPL-EX120, VPL-EX121, VPL-EX123, VPL-EX130, VPL-EX145, VPL-EX146, VPL-EX147, VPL-EX148, VPL-EX175, VPL-EX176, VPL-EX178, VPL-EX221, VPL-EX222, VPL-EX225, VPL-EX226, VPL-EX241, VPL-EX242, VPL-EX245, VPL-EX246, VPL-EX271, VPL-EX272, VPL-EX273, VPL-EX274, VPL-EX275, VPL-EX276, VPL-F400H/X, VPL-F401H, VPL-F420HZ, VPL-F500H/X, VPL-F501H, VPL-F600X, VPL-F700HL/XL, VPL-F720HZ , VPL-FE40, VPL-FH30, VPL-FH31, VPL-FH35, VPL-FH36, VPL-FH300L, VPL-FH500L, VPL-FHZ55, VPL-FHZ700, VPL-FW300L, VPL-FX30, VPL-FX35, VPL-FX37, VPL-FX40, VPL-FX41/L, VPL-FW41/L, VPL-FX50, VPL-FX51, VPL-FX52, VPL-FX, VPL-PX11, VPL-FX15, VPL-FX35, VPL-FX40, VPL-FX41, VPL-FX50, VPL-FX51, VPL-FX52, VPL-FX500L, VPL-HW15, VPL-HW30, VPL-HW50, VPL-PX11, VPL-PX15, VPL-PX35, VPL-PX40, VPL-PX41, VPL-SW125, VPL-SW525/C, VPL-SW526/C, VPL-SW535/C, VPL-SW536, VPL-SX525, VPL-SX535, VPL-SX536, VPL-TX7, VPL-TX70, VPL-VW70, VPL-VW85, VPL-VW95, VPL-VW200, VPL-VW1000 ***VPL-ES3 and EX3 are no parity, all other even.**

T460 Channel	Char sent as Data 5	Function
1	00h	Video
2	01h	S-Video
3	02h	Input A (Analog RGB computer / Component / GBR) on D-15)
4	03h	Input B (Analog RGB, D-15) / DVI analog or digital / HDMI
5	04h	Input C (RGB, DVI, DVI-D,HDMI) (PC card/memory stick or Ethernet)
6	05h	Input D D-15 / Comp. Video / Video RGB / HDMI / LAN/HDbaseT / USB-B
7	06h	Input E Computer / Component Video / Video RGB / LAN / USB-B
8	07h	Input F Computer / Component Video /Video RGB / USB-A / LAN

There are multiple setup selections available for Inputs A -> F; these are selected via the menu setup or via the IR remote. T460 selection does not extend to these preset functions, as they are not available for RS232 control. **Note: Users can set FlagG=1 (see flag setup menu) to enable sending ATA (Automatic Pixel Align) after each source transmission to this model projector. (was Flag1)**

Sony LCD panels

Group 1: FWD-32/40LX1/R, FWD-50PX2

Sony LCD setup means allocating input names to each of the eight channels allowed, using the table below:

T460 Channel	String sent (5th byte)	Input (on screen)	Function / connection
1	00AH	HD15	RGB PC Analog (D SUB 15)
2	020H	DVI	DVI
3	00CH	Option 1	Composite Video BNC
4	00DH	Option 1	S-Video (DIN 4)
5	00EH	Option 1	RGB Digital Input 2
6	00FH	Option 1	Component 2
7	00BH	YUV	RGB Component (D SUB 15)
8	010H	BNC	Option 2 Video (FWD-40LX1 only)

Sony LCD panel: Group 2: FWD-32/40LX2F/X and KLH-W26/32

Sony LCD setup means allocating input names to each of the eight channels allowed, using the table below:

T460 Channel	String sent (5th byte)	Input (on screen)	Function / connection
1	008H	HD15	PC Analog (D SUB 15)
2	009H	HD15	Component (D SUB 15)
3	010H	Option 2	Composite Video (Note: BNC)
4	011H	Option 2	S-Video (DIN 4)
5	044H	HDMI 1	RGB Digital Input 2
6	045H	HDMI 1	DTV Digital Input 2
7	054H	HDMI 2	RGB Digital Input 3
8	055H	HDMI 2	DTV Digital Input 3

Sony LCD panel: Group 3: FWD-42PV1/A/P (and FWD-42V1, FWD-42X1, FWD-50PX1)

Sony LCD setup means allocating input names to each of the eight channels allowed, using the table below:

T460 Channel	String sent (5th byte)	Input (on screen)	Function / connection
1	00AH	HD15	RGB PC Analog (D SUB 15)
2	020H	DVI	DVI
3	010H	Option 1	Composite Video BNC
4	011H	Option 1	S-Video (DIN 4)
5	012H	Option 1	RGB Digital Input 2
6	013H	Option 1	Component 2
7	00BH	YUV	RGB Component (D SUB 15)
8	00CH	BNC	Option 2 Video

Sony LCD panel: Group 4: FWD-S42E1, FWD-S42H1, FWD-S47H1

Sony LCD setup means allocating input names to each of the eight channels allowed, using the table below:

T460 Channel	String sent (5th byte)	Input (on screen)	Function / connection
1	008H	HD15	RGB PC Analog (D SUB 15)
2	020H	DVI	DVI
3	030H	Video	Composite Video BNC
4	031H	S-Video	S-Video (DIN 4)
5	009H	HD15	RGB YUV (D-Sub 15)
6	00EH	Option 1	RGB PC (D Sub 15)
7	00FH	Option 1	RGB Component (D SUB 15)
8	084H	HDMI 1	HDMI 1

Sony LCD panel: Group 5: GXD-L52H1, GXD-L65H1

Sony LCD setup means allocating input names to each of the eight channels allowed, using the table below:

T460 Channel	String sent (5th byte)	Input (on screen)	Function / connection
1	008H	HD15	RGB PC Analog (D SUB 15)
2	020H	DVI	DVI
3	030H	Video	Composite Video BNC
4	031H	S-Video	S-Video (DIN 4)
5	009H	HD15	RGB YUV (D-Sub 15)
6	084H	HDMI 1	HDMI 1
7	085H	HDMI 2	HDMI 2

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

The driver routines provide for audio setting via the LCD, showing a range of 0 … 20 on the T460 display, mapping to 0 … 100 on the LCD. Volume is not normally shown on the panel screen.

The mute function is Audio ONLY by pressing both yellow keys together. No Freeze function is supported, so only use Vol Up/Down keyboards. FlagG sets AutoPixelAlign for DB15 channels. Roll of aspect ratios is supported by dummy channel using channel: "**4:3/16:9/Zm**."

Only two audio inputs are provided (other than the HDMI): One shared between Composite and S-Video and one used for the DB15 functions. If more are needed, use the T461. If a T461 is selected, don't forget to map the channels in the setup screen.

Sony LCD panel: Group 6: KDL BRAVIA family FY11 series

HX92x/82x/72x series, NX72x series, EX72x/62x/52x/46x/42x/32x series, CX52x/400 series, 60W600B

These all communicate via a Sony supplied CBX-H10/1 or CBX-H11/1 to HDMI communications box. The panels themselves do NOT have an RS232 interface. (A cable from this box plugs into any unused HDMI connector. "Control for HDMI" must be set to "On" in the setup menu. A setup document "CBX-H11 Control info.pdf" is available from JED or directly from Sony.)

Sony LCD setup means allocating input names to each of the eight channels allowed, using the table below:

T460 Channel	String sent (5/6/7 th bytes)	Input (on screen)	Function / connection
1	005H,001H,097H	PC	RGB PC Analog (D SUB 15) + 3.5 audio
2	002H,001H,094H	Video 1	Composite Video1 RCA + 2 RCA audio
3	003H,001H,095H	Video 2 / Component	RGB 3 RCA + 2 RCA audio
4	004H,001H,096H	HDMI 1	HDMI 1
5	004H,002H,097H	HDMI 2	HDMI 2
6	004H,003H,098H	HDMI 3	HDMI 3
7	004H,004H,099H	HDMI 4	HDMI 4
8	001H,091H	DTV	TV

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

The driver routines provide for audio setting via the LCD, showing a range of 0 … 20 on the T460 display, mapping to 0 … 100 on the LCD. Volume is not normally shown on the panel screen.

The **mute/blank** function of audio/video is supported by pressing both yellow keys together. No Freeze function is supported, so only use Vol Up/Down or MuteOn/Off keyboards.

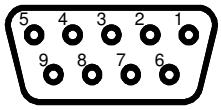
Aspect ratio control is included. Use source names: "**Set reg 4:3**" and "**Set reg 16:9**".

Only two audio inputs are provided (other than the HDMI): One shared between Composite and S-Video and one used for the DB15 functions. If more are needed, use the T461. If a T461 is selected, don't forget to map the channels in the setup screen.

RS232 connections to Sony projectors and LCD flat panels

These all use a D-sub 9-pin connector, male on cable.

VPL- CX85/86, FX50/51/52, PX11/15/35/40/41 38400 BAUD, Even parity, 1 stop.
VPL- ES3/EX3, 38400 BAUD, No parity, 1 stop.
FWD-32/40LX2F/X, KDL and KLH-W26/32 LCD, 9600 BAUD, No parity, 1 stop.

Function/Direction	T460 "projector" Connection	Projector Connector (Male on cable)	 D-sub 9 male solder side
Ground	Ground	9-pin D-sub pin 5	
Data from T460 to projector	Tx	9-pin D-sub pin 2 (RXD)	
Reply data from projector to T460	Rx	9-pin D-sub pin 3 (TXD)	
Plus 9 volt CTS/DTR to projector	N/C	N/C	

After installation wiring of any projector to a T460, use a multimeter to check voltages of –9 on BOTH TX and RX pins in any installation, as described in the troubleshooting part of this manual.

Taxan-Kaga-Plus projector families:

KG-PV-131S/X/XH, KG-PS-232X/Xh

This family of projectors can be operated at 115,200 baud or 19,200 baud. As shipped from Plus, communications is at 115,200 baud, and **must be set using a PC to 19,200 for use with a T460**. (The T460 does NOT have a 115,200 baud option.)

It can be switched to operate at 19,200 by the following sequence:

Connect to a PC via a straight-though serial cable and run HyperTerminal, setting it up to run at 115,200 baud, 8 bit data, 1 start, 1 stop, no parity, no hardware handshake (8N1). (Unless you have enabled "local echo", you will not see the characters as you type them. You can enable echo by going to **File->Properties->Settings->ASCII** Setup and ticking **Echo typed characters locally**.) HyperTerminal is found under Accessories or Programs in the Windows system or can be downloaded from: http://www.hilgraeve.com/hyperterminal.html

Verify communications by typing **#QS(CR)(LF)** (The "**QS**" must be upper case. The CR and LF must follow. Send a CR with the **ENTER** key, and send the LF by holding down **CTRL** and pressing **ENTER.**) The projector should reply with its status, eg **#QS021** if OFF, and **#QS051** if warmed up and running.

If, **OFF**, the projector can be turned **ON** with the **#PO(CR)(LF)** command. (The character after the **P** is alphabetic U/C "O".)

Now set it to 19,200 baud by sending a command **#CL(CR)(LF)** from a PC running HyperTerminal at 115,200 baud. (It will switch immediately, so the reply will be gibberish.)

Now terminate the HyperTerminal session at 115,200 baud and restart it at 19200 baud, (8N1, no handshake, local echo enabled). Type **#QS(CR)(LF)** and verify status reply at 19,200 baud. A **#PF(CR)(LF)** command powers down the Taxan. (The Taxan can be reset to 115,200 baud with a **#CH(CR)(LF)** command.)

The baud rate is held in projector non-volatile memory, so the baud rate setting to 19,200 need be done only once.

The following table shows the mapping of T460 channel number, the string sent, and the input associated with that channel in the manual, and how it is identified on the on-screen menu:

T460 Channel	TX string	Input name in manual	Function as identified on screen
1	#SA 0Dh, 0Ah	RGB or DVI	RGB (U5) DVI (U7)
2	#SB 0Dh, 0Ah	RGB 2 (also via DVI)	RGB (U7 only)
3	#SV 0Dh, 0Ah	Comp Video	Video
4	#SS 0Dh, 0Ah	S-VIDEO	S-Video

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

Turn OFF the "Auto Source" function in the projector. Also, turn off "Auto power Off". Instead use the Run Timer in the T460.

(Projector lamp hour readout is not fully tested … reports welcomed from users.)

The driver supports Mute On/Mute Off keyboards and Freeze On/Off and Mute On/Off keyboards. These are toggles with no read-back, so two-yellow-button mute mode is NOT supported.

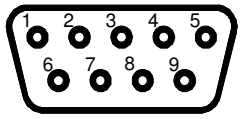
These is only one audio input and no output, so audio control in the projector is NOT supported. Use a T441 or T461.

Reply mode is supported for manual closedown detect.

RS232 connections to Kaga -Taxan - Plus projectors

These use a 9-pin-D9 male on the projector, female on cable. Comms is at 19200 baud, 8 bits, no parity, 1 stop.

Function/Direction	**T460 "projector" Connection**	**"Serial" Port Connector**
Ground	Ground	9-pin D-sub pin 5
Data from T460 to projector	Tx	9-pin D-sub pin 3
Reply data from projector to T460	Rx	9-pin D-sub pin 2
Plus 9 volt CTS/DTR to projector	N/C	N/C



D-sub 9 female solder side

After installation wiring of any projector to a T460, use a multimeter to check voltages of –9 on BOTH TX and RX pins in any installation, as described in the troubleshooting part of this manual.

TEAC Plasma:

PLMSDM1060, PLMHDM1065, PLMHDM1275

The following table shows the mapping of T460 channel number, the string sent, and the input associated with that channel in the manual, and how it is identified on the on-screen menu:

T460 Channel	**TX codes**	**Input name in manual**	**Function as identified on screen**
1	91h 01h	AV1 Composite	Video 1
2	91h 02h	AV2 S-Video	Video 2
3	91h 03h	AV3	Video 3
4	91h 04h	Component 1	
5	91h 05h	Component 2	
6	91h 06h	RGB 9-pin D-sub (Analog)	PC Analog
7	91h 07h	DV1	PC Digital

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

RS232 connections to TEAC Plasma with D9

These use a 9-pin-D9 male on the plasma, female on cable. Comms is at 9600 baud, 8 bits, no parity, 1 stop.

Function/Direction	**T460 "projector" Connection**	**"Serial" Port Connector**
Ground	Ground	9-pin D-sub pin 5
Data from T460 to projector	Tx	9-pin D-sub pin 3 (RXD)
Reply data from projector to T460	Rx	9-pin D-sub pin 2 (TXD)
Plus 9 volt CTS/DTR to projector	"RTS"	N/C

After installation wiring of any projector to a T460, use a multimeter to check voltages of –9 on BOTH TX and RX pins in any installation, as described in the troubleshooting part of this manual.

Toshiba projectors

For **Toshiba TDP-S3/T3** see InFocus models: LP500/520/530.

Make sure to turn off "Auto input search" in the third menu of the projector.

Group 1.1: TLP-S200/S201/S220/S221, TLP-T400/T401, TLP-T500/T501/T520/T521, TLP-T600/T601/T620/T621, TLP-T700/T701/T720/T721

Group 1.2: TDP-MT200/MT400

Group 1.3: TDP-S20/S21/SC21/S25/SC25/SW25/S35/SC35/SW35 TDP-S80/SW80/S81/T90/TW90/T91/T99/TW99, TLP-710/711

Group 1.4: TDP-S8/S10, SW20, TDP-T8/T9/T30/T40/T45/T80/T98, TLP-250/251/260/261 TLP-380/381/550/551/560/561/780/781/790/791, TLP-MT7E, TLP-X10U/11U/20U/21U

Group 1.5: TDP-D1/D2, TLP-S30/S40/S41/S70/S71, TLP-T50/T60/T61/T70/T71,

Group 1.6: TLP-450/451/470/471/650/651/670/671/680/681/, TLP-B2/U (RGB set only Ch 1).

T460 Ch	TX Codes	Group 1.1	Group 1.2	Group 1.3	Group 1.4	Group 1.5	Group 1.6
1	STX IN1 ETX	RGB1	RGB1	RGB1	RGB1	RGB	RGB
2	STX IN2 ETX	YPbPr1	DVI	RGB2	RGB2	YPbPr	Video
3	STX IN3 ETX	RGB2	Video	Video	Video	Video	Camera
4	STX IN4 ETX	YPbPr2	S-Video	S-Video	S-Video	S-Video	
5	STX IN5 ETX	Video	YPbPr	Camera	PC-Card	Camera	
6	STX IN6 ETX	S-Video		Network	Camera		
7	STX IN7 ETX	PC-Card					
8	STX IN8 ETX	Camera					

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

Group 2.1: TDP-T/TW95, T/TW100, TDP-T250/TW250, TDP-T300/TW300, TDP-T350/TW350, TDP-T355/TW355

Group 2.2: TLP-X2000/XC2000/XD2000, TLP-X2500/XC2500, TLP-X3000/XC3000, TLP-WX2200

Group 2.3: TDP-ST20, TDP-EX20, TDP-EW25

T460 Ch	TX codes	Group 2.1	TX codes	Group 2.2	TX codes	Group 2.3
1	STX IN3 ETX	RGB1/DVI-A	STX IN3 ETX	RGB1	STX IN3 ETX	RGB1
2	STX IN4 ETX	YPbPr1/DVI-A	STX IN4 ETX	YPbPr1	STX IN4 ETX	YPbPr1
3	STX IN5 ETX	RGB2/DSUB	STX IN5 ETX	RGB2	STX IN5 ETX	RGB2
4	STX IN6 ETX	YPbPr2/DSUB	STX IN6 ETX	YPbPr2	STX IN6 ETX	YPbPr2
5	STX IN9 ETX	Video	STX IN9 ETX	Video	STX IN9 ETX	Video
6	STX INA ETX	S-Video	STX INA ETX	S-Video	STX INA ETX	S-Video
7	STX IN8 ETX	None/BNC 3 YPbPr 3/Camera	STX INB ETX	Camera	STX INC ETX	Network
8	STX IND ETX	USB/Wireless			STX IND ETX	USB/Wireless

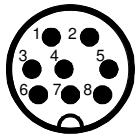
Group 3: TLP-X100,TLP-X150,TLP-X200,TLP-WX100,TLP-WX200

T460 Ch	TX codes	Group 3
1	#INP:1<CR>	RGB1/D-SUB 15
2	#INP:2<CR>	YPbPr1/ D-SUB 15
3	#INP:3<CR>	RGB2/ D-SUB 15
4	#INP:4<CR>	YPbPr2/ D-SUB 15
5	#INP:9<CR>	Video
6	#INP:10<CR>	S-Video
7	#INP:5<CR>	HDMI
8	#INP:12<CR>	Network

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

RS232 connections to Toshiba projectors with DIN-8 connectors

The majority all use a mini-DIN 8 male connector wired, as follows: (Comms is at 9600 baud, 8 bits, no parity, 1 stop)

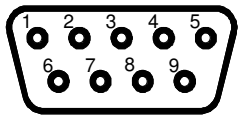
Function/Direction	T460 "projector" Connection	Toshiba Control Port Connector	
Ground	Ground	mini-DIN 8 pin 4	
Data from T460 to projector	Tx	mini-DIN 8 pin 1 (RXD)	
Reply data from projector to T460	Rx	mini-DIN 8 pin 7 (TXD)	
Plus 9 volt CTS/DTR to projector	CTS	mini-DIN 8 pin 2 (opt.)	

NOTE: We have noticed that a number of Toshiba projectors have a VERY small hole in the plastic case surrounding the mini-DIN 8 RS232 "Control" port connector, such that commonly available plugs, while they appear to plug in OK, and are held firm, in fact don't actually connect the pins, just the outer shell. If you have comms problems, this may be the cause.

Multimeter checks of RS232 voltage levels will show no connections. We fixed it by removing the outer plastic shell sleeve, and just using the plug internals, with the two split metal sections and the two split plastic sections, and then heat-shrink a 15mm sleeve of 12mm tubing around the outer 15mm length only of the plug, leaving the far end of the plug free of plastic. Some pre-assembled (moulded) connectors may be OK, where you can cut the other end off and re-terminate, but the self-assembly ones could be nasty!

RS232 connections to Toshiba TLP-X100,TLP-X150,TLP-X200,TLP-WX100,TLP-WX200

These use a 9-pin-D9 male on the projector, female on cable. (Comms is at 9600 baud, 8 bits, no parity, 1 stop.)

Function/Direction	T460 "projector" Connection	"Serial" Port Connector	
Ground	Ground	9-pin D-sub pin 5	
Data from T460 to projector	Tx	9-pin D-sub pin 3	
Reply data from projector to T460	Rx	9-pin D-sub pin 2	
Plus 9 volt CTS/DTR to projector	N/C	N/C	

After installation wiring of any projector to a T460, use a multimeter to check voltages of –9 on BOTH TX and RX pins in any installation, as described in the troubleshooting part of this manual.

RS232 connections to Toshiba projectors TLP-710/711

These use a D-sub 9 pin connector (documentation does not show male/female):

Function/Direction	T460 "projector" Connection	Toshiba Control Port Connector
Ground	Ground	9-pin D-sub pin 5
Data from T460 to projector	Tx	9-pin D-sub pin 2
Reply data from projector to T460	Rx	9-pin D-sub pin 3
Plus 9 volt CTS/DTR to projector	CTS	9-pin D-sub pin 7 (seems optional)

After installation wiring of any projector to a T460, use a multimeter to check voltages of –9 on BOTH TX and RX pins in any installation, as described in the troubleshooting part of this manual.

2-Touch / CTOUCH LCD touch panel.

These are an LG-style panel with touchscreen add-on on the front, in sizes of 46", 55", 65", 70", 82" and 84".

Setup means allocating input names to each of the eight channels allowed, using the table below:

T460 Channel	String sent	Input (on screen)	Function / connection
1	'kb 00 00',00DH	Dig TV	Tuner
2	'kb 00 02',00DH	AV	RCA Composite Video
3	'kb 00 03',00DH	S-Video	S-Video (DIN 4)
4	'kb 00 04',00DH	Component	RCA
5	'kb 00 07',00DH	PC-RGB	DB15
6	'kb 00 09',00DH	HDMI 1	HDMI 1
7	'kb 00 0a',00DH	HDMI 2	HDMI 2
8	'kb 00 0b',00DH	HDMI 3	HDMI 3

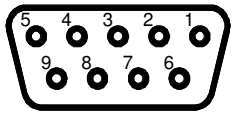
Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

RS232 connections to 2-Touch / CTOUCH LCD projectors:

D-SUB 9 Female on panel, male on cable. Comms at 9600 8N1.

Note: Connector wiring on 2-Touch and CTOUCH documentation is totally incorrect, (e.g. Gnd on pin 1, links on 8->9) Following has been tested and works correctly.

Function/Direction	T460 "projector" Connection	Panasonic Serial Port Connector
Ground	Ground	9-pin D-sub pin 5
Data from T460 to projector	Tx	9-pin D-sub pin 3 (RXD)
Reply data from projector to T460	Rx	9-pin D-sub pin 2 (TXD)
Plus 9 volt CTS/DTR to projector	N/C	N/C



D-sub 9 male solder side

After installation wiring of any projector to a T460, use a multimeter to check voltages of –9 on BOTH TX and RX pins in any installation, as described in the troubleshooting part of this manual.

Viewsonic projector (non-Hitachi models):

Units with Toggle Blank/Mute/Freeze: PJD5112, PJD6210, PJD6211, PJD6212, PLD6220, PLD6221, PJD6230, PJD6240, PJD6241, PJD6251, PJD6381, PJD6531w, Pro8450w, Pro8500, Pro8600.

Units with Absolute Blank/Mute/Freeze: PJD5123, PJD5223, PJD5232, PJD5234, PJD5345, PJD5353, PJD6243, PJD6544w, PJD7223, PJD7333, PJD7533w, PJD8333s, PJD8633ws.

Setup means allocating input names to each of the eight channels allowed, using the table below:

T460 Channel	String sent (4/5/6th byte)	Input (on screen)	Function / connection
1	000h, 019h, 029h	RGB1	RGB 1 PC Analog (D SUB 15)
2	01Eh, 090h, 072h	RGB2	RGB 2 PC Analog (D SUB 15) (some)
3	000h, 078h, 0A8h	Video	Composite Video BNC
4	000h, 0E8h, 069h	S-Video	S-Video (DIN 4)
5	000h, 0DAh, 02Bh	Component/HDMI	RGB YUV or HDMI 1 (some)
6	000h, 089h, 0E8h	Component	Component (some)
7	000h, 0DFh, 043h	LAN	LAN

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

Pro8100, Pro8200, Pro8300, Pro8400P. (Note: still under test)

Setup means allocating input names to each of the eight channels allowed, using the table below:

T460 Channel	String sent (6/7/8th byte)	Input (on screen)	Function / connection
1	0BCh, 0D3h, 035h	RGB1	RGB 1 PC Analog (D SUB 15)
2	08Fh, 0D3h, 036h	RGB2	RGB 2 PC Analog (D SUB 15) (some)
3	0A1h, 0D2h, 038h	Video	Composite Video BNC
4	070h, 0D3h, 039h	S-Video	S-Video (DIN 4)
5	05Eh, 0D2h, 037h	Component	RGB YUV
6	043h, 0D3h, 03Ah	HDMI 1	HDMI 1
7	092h, 0D2h, 03Bh	HDMI 2	HDMI 2
8	08Ah, 0DFh, 063h	LAN	LAN

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

Audio provision is minimal, some have an input or two, most have no outputs. Use a T461 or T441 if audio control is needed. (Incremental volume commands are included.)

The Video mute (blank) function (toggle only) is supported by a "Mute-On/Mute-Off" keyboard. Toggle Freeze function is supported on some. Two yellow button "Mute" mode is NOT supported.

Reply mode is supported.

This family supports aspect ratio control via the dummy channel, say, Ch 8, to "4:3/16:9/Zm.".

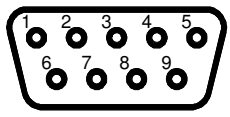
FlagG sets AutoPixelAlign for DB15 channels.

RS232 connections to Viewsonic projectors with D9 connectors

Following use D9 female on cable: PJD5112, PJD6211, PJD6212, PJD6221, PJD6241, PJD6251, PJD6381, and PJD6531w

These use a 9-pin-D9 male on the projector, female on cable. (Coms is at 19200 BAUD, no parity, 1 stop.)

Function/Direction	**T460 "projector" Connection**	**Viewsonic Control Port Connector D9**
Ground	Ground	9-pin D-sub pin 5
Data from T460 to projector	Tx	9-pin D-sub pin 3
Reply data from projector to T460	Rx	9-pin D-sub pin 2
Plus 9 volt CTS/DTR to projector	n/c	n/c



D-sub 9 female solder side

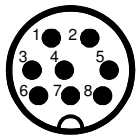
After installation wiring of any projector to a T460, use a multimeter to check voltages of –9 on BOTH TX and RX pins in any installation, as described in the troubleshooting part of this manual.

RS232 connections to Viewsonic projectors with DIN-8 connectors

Following use Din8 connector: PJD6210

These use a mini-DIN 8 male connector wired, as follows: (Comms is at 19200 baud, 8 bits, no parity, 1 stop)

Function/Direction	**T460 "projector" Connection**	**Viewsonic Control Port Connector DIN-8**
Ground	Ground	mini-DIN 8 pin 4
Data from T460 to projector	Tx	mini-DIN 8 pin 1 (RXD)
Reply data from projector to T460	Rx	mini-DIN 8 pin 7 (TXD)
Plus 9 volt CTS/DTR to projector	CTS	n/c



mini-DIN 8
solder side view

After installation wiring of any projector to a T460, use a multimeter to check voltages of –9 on BOTH TX and RX pins in any installation, as described in the troubleshooting part of this manual.

RS232 connections to Viewsonic projectors with DIN-6 connectors

Following use Din8 connector: PJD6220, PJD6230, and PJD6240

The majority all use a mini-DIN 6 male connector wired, as follows: (Comms is at 19200 baud, 8 bits, no parity, 1 stop)

Function/Direction	**T460 "projector" Connection**	**Viewsonic Control Port Connector DIN-6**
Ground	Ground	Mini-DIN Pins 1, 2
Data from T460 to projector	Tx	Mini-DIN Pin 3 (RXD)
Reply data from projector to T460	Rx	Mini-DIN Pin 5 (TXD)
Plus 9 volt CTS/DTR to projector	n/c	n/c

Mini-DIN 6 solder side

After installation wiring of any projector to a T460, use a multimeter to check voltages of –9 on BOTH TX and RX pins in any installation, as described in the troubleshooting part of this manual.

Vivitek: See Optoma group 5 for Vivitek Generic 1, 2, 3.

Note: Vivitek have some projectors which respond to multiple code sets. Very confusing.

Vivitek: Generic 1, 2 (9600) (~SR etc. group): **D82EX, D863, D925, D927, D930, D935, D940, D945, H1080, D1085**

Vivitek: Generic 3 (9600) (~S1 etc. group), **D5500, D6000, D6500, D6510**, **Projection Design**: **DP3650**

Vivitek Generic 4: D54HA, D55BA, D86, D87, D501ZAA, D501ZAA, D501ZWAA, D516, D517, D518, D519, D548, D550, D551, D552, D553, D554, D555, D556, D557, D557W, D557WH, D560ST, D751ST, D755WT/i, D791ST, D795WT, D837, D850, D851, D853W, D855ST, D856, D857WT, D858, D859, D860, D861, D862, D863, D864, D865W, D867, D869, D871ST, D873ST, D910HD, D912HD, D965, D966HD, D967, D968U, D5005, D5010, D5110W, D5180HD, D5185HD, D5010, D5190HD, D5280U, D5290U, D5380U, D7080HD, D7180, H1180HD, H1185HD (also **Digital Projection**)

Setup means allocating input names to each of the eight channels allowed, using the table below:

T460 Channel	String sent	Input (on screen)	Function / connection
1	V99S0201 +0Dh	RGB1	RGB 1 PC Analog (D SUB 15)
2	V99S0202 +0Dh	RGB2	RGB 2 PC Analog (D SUB 15) (some)
3	V99S0204 +0Dh	Video	Composite Video BNC
4	V99S0205 +0Dh	S-Video	S-Video (DIN 4)
5	V99S0207 +0Dh	RGB	BNC (some)
6	V99S0203 +0Dh	DVI	DVI-A and DVI-D automatic (some)
7	V99S0206 +0Dh	HDMI	HDMI (1)
8	V99S0209 +0Dh	HDMI 2	HDMI 2 (some)

Don't forget to set all unused T460 channels to "Skip" to jump over blank/unused inputs.

Audio provision range is 0->10 (some are actually 0->8) only. Use a T461 or T441 if more audio control is needed.

The Video mute (blank) function is supported by a "Mute-On/Mute-Off" keyboard. Freeze is supported. Two yellow button "Mute" mode is supported for video blank only on some, audio AND video on more recent ones.

You must set "Standby Mode" to "Standard" (some only). Turn "Auto Source" OFF. Set "No Signal Power Off (min)" to "0".

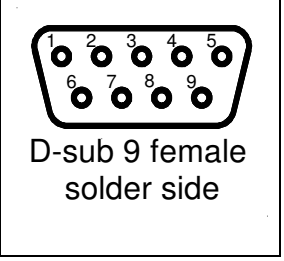
Reply mode is supported.

Aspect ratio control is included. Use source names: "Set reg 4:3" and "Set reg 16:9".

FlagG sets AutoPixelAlign for DB15 channels.

RS232 connections to Vivitek projectors with D9 connectors

These use a 9-pin-D9 male on the projector, female on cable. (Coms is at 9600 BAUD, no parity, 1 stop.)

Function/Direction	T460 "projector" Connection	Viewsonic Control Port Connector D9	
Ground	Ground	9-pin D-sub pin 5	
Data from T460 to projector	Tx	9-pin D-sub pin 2	
Reply data from projector to T460	Rx	9-pin D-sub pin 3	
Plus 9 volt CTS/DTR to projector	n/c	n/c	

D-sub 9 female solder side

After installation wiring of any projector to a T460, use a multimeter to check voltages of –9 on BOTH TX and RX pins in any installation, as described in the troubleshooting part of this manual.

(Another Group not currently supported till we get one to test: D8300/EST/LT/ST, D8010W, D8800, D8900)